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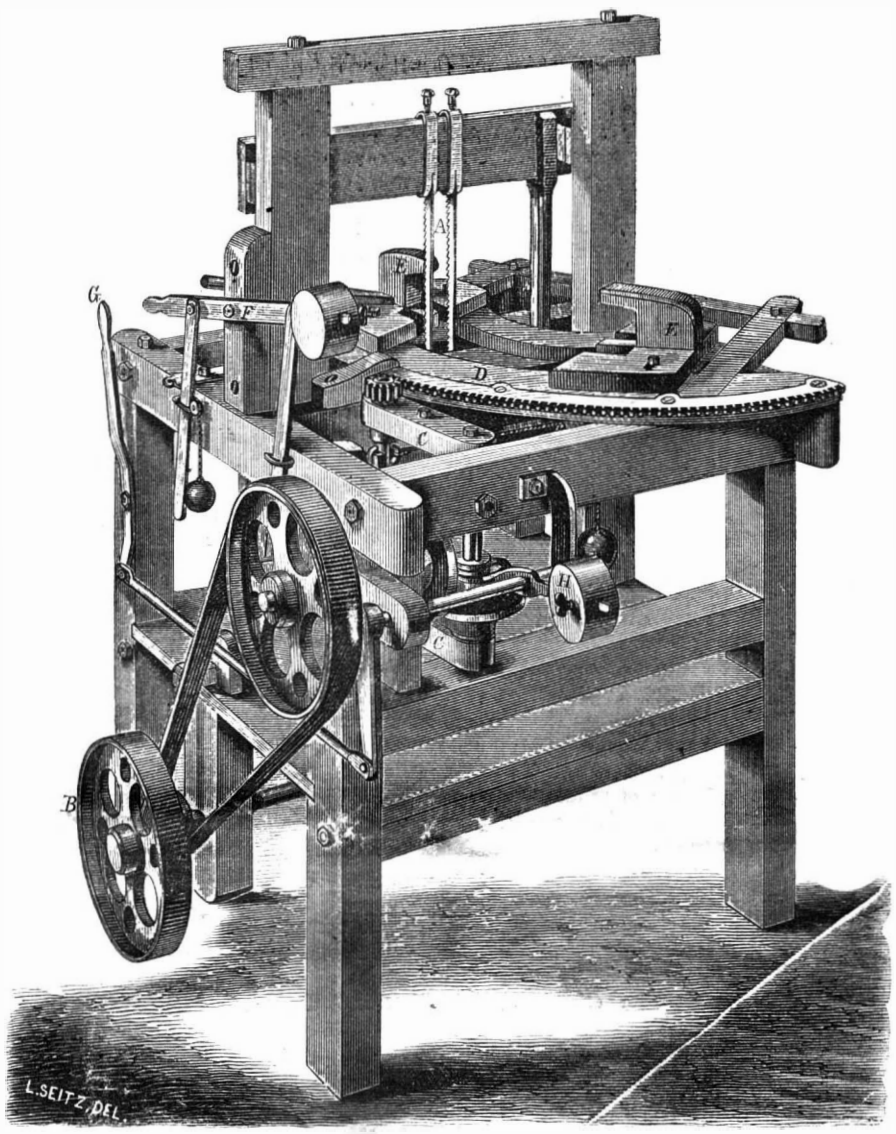
Improvement in Machinery for Sawing Wheel Fellies.

The object of the machine shown in the engraving is to afford a ready and rapid means of sawing out the sections forming the rims of wagon and carriage wheels, both edges being sawed at the same time, and the machine being adjustable so that the segments may be sawed on different radii and the feed be adjusted to accommodate the nature of the timber and the design of the operator.

The saws, A, are suspended in the usual manner, the power being applied to the crank shaft through the medium of the pulley, B. From this shaft runs a belt connecting with another which drives the feed. On the inner end of this shaft is a friction wheel that engages with another at right angles to it and secured to a vertical shaft, which forms a pivot for the frame, C. At the inner end of this frame is an upright shaft connecting, by means of belt and pulleys, the two upright shafts. This frame may be swung from one position to another while the belt from the pivot shaft will act as well in one position as another. On the top of the inner upright shaft is a pinion that engages with the segment, D, which is suspended by an adjustable pivot so it may be moved to or from the saw, making the product of a less or greater diameter. This segment is really the table, the material being held to it by the jaws, E, which are also adjustable. A weighted lever, F, is used to throw the frame, C, and its pinions in gear with the segment, D, a catch holding it in position. This catch is disengaged antomatically by an arm on the segment, when the saw has passed through the stock, so that the table can be swung around to receive more material.

The rate of feed is governed by means of the friction wheel on the pivot shaft of the frame, C, which may be raised, by means of the handle, G, operating a weighted lever, H, and clutch. As this wheel is raised toward the center of the wheel on the horizontal shaft its momentum is reduced and consequently the rate of feed.

A patent for this is pending through the Scientific American Patent Agency. All communications should be addressed to the inventor, Peter S. Beidler, South Easton, Pa.



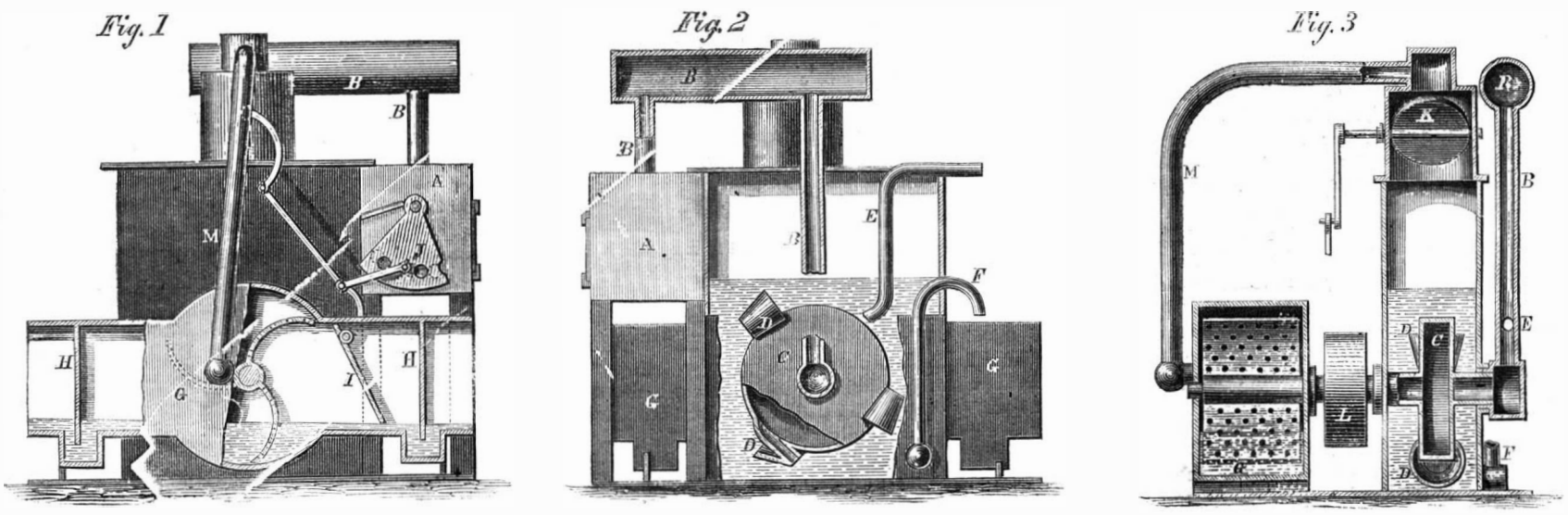
BEIDLER'S AUTOMATIC FELLY SAWING MACHINE.

Improved Cane-juice Bleaching Machine.

The object of the machine which the annexed engravings illustrate, is to thoroughly and evenly bleach the saccharine juice of the cane, insuring a uniform grade of sugar. It is, to a great extent, automatic in its operation and self-regulating. In the engravings, A is a furnace in which the sulphur is burned, the gas from which is conducted by gas pipes, B, to a hollow shaft and wheel, C, furnished with draft nozzles, D, and rotating under water in the chamber. E is a water supply pipe leading from any connecting reservoir, and F a discharge pipe for controlling the level of the water in the chamber.

The juice is received into the trough, G, which is slightly inclined from a level, as seen in Fig. 1, and has two depressions one at either end, to receive the pendant partitions, H, extending transversely across the trough. A wheel, the blades of which are curved and perforated, revolves in the trough, G, about midway between the ends, and on a shaft in line and connected with the hollow shaft on which the wheel, C, is fixed. At the rear of this wheel is a pendant valve, I Fig. 1, connected by jointed arms with a register on the furnace, A, and with a damper, K, in a chamber over the water tank as seen in Figs. 2 and 3.

The operation of the devise can be readily understood from the above references to the parts. The furnace being supplied with sulphur and the latter ignited, the wheel, C, and that in the trough are rotated by a belt on the pulley, L, Fig. 3, from any source of power. Water is fed through the pipe E to the chamber in which the hollow wheel, C, rotates. The rotation of this wheel draws the gas from the furnace through the pipes, B, passing it through the water to the chamber in which the damper, K, is situated. From thence it is led by the pipe, M, Figs. 1 and 3, to the dash wheel in the juice trough, G, where it is incorporated with the saccharine liquid. The action of the dash-wheel against the pendant valve, I, operates the register, I, and damper, K, and governs the amount of gas admitted to the juice, and the combustion of the sulphur. The pendant partitions prevent the escape of the gas, as they extend down below the surface of the liquid. A patent for this device is now pending, application having been made through the Scientific American Patent Agency by Evan Skelly, of Plaquemines Parish, La.



SKELLY'S CANE-JUICE BLEACHING MACHINE.

The Prospects of the Suez Canal.

Mere speculators, and particularly English speculators, have held aloof from the Suez Canal Company, and it has, therefore, been carried on chiefly by French capitalists. This apparent want of enterprise has been caused by the magnitude of the undertaking and the want of definite answers to such questions as, "Will the canal ever pay?" "How much more capital will be required for its completion?" and "Is there no chance of competition?" A feeling of jealousy toward France also contributed to English distrust. One of the directors of the company writes to the *London Times* to supply this deficiency. He expects that when the canal is opened two thirds of the traffic now passing around the Cape will be diverted. Such traffic he estimated at the lowest as 600,000,000 tuns annually two thirds of which would yield at $2 per tun, an income of $8,000,000 per annum. Seeing that more voyages could be made by the same vessle by the shorter distance, the writer anticipates a larger income than this which, it must be observed, is from merchandise merely, leaving passengers out of the question. The cost for maintenance and the interest on loans is estimated at about $4,000,000, leaving the same sum for division—a very fair dividend of 10 percent. No more capital will be required after the arrangement of the present loan of $20,000,000, the total amount subscribed being $60,000,000. As to whether the canal is safe from future competition by the Euphrates Valley line, no great evil from opposition is apprehended. Lord Clarence Paget inspected the works in 1867, and was of opinion that they would succeed.

In France the capitalists are rather slow in coming forward with any more money. The result is that the legislative body has taken the matter up, and passed a bill which allows the managers to get up a lottery in aid of the enterprise. The lottery custom was put down in 1836, but it has been again permitted—"just this once." Berryer, Thiers, and a great number of others, abstained from voting, or stayed away, and some of the minority said some dreadful things about the immorality of lotteries. And yet they have, in their time, built churches, hospitals, etc.; they helped Queen Elizabeth to beat the Spanish Armada, and they may help M. Lesseps to complete his cosmopolite canal. In this age, however, a reasonable distrust may well be entertained of the financial management of any enterprise that resorts to such questionable means to obtain money.

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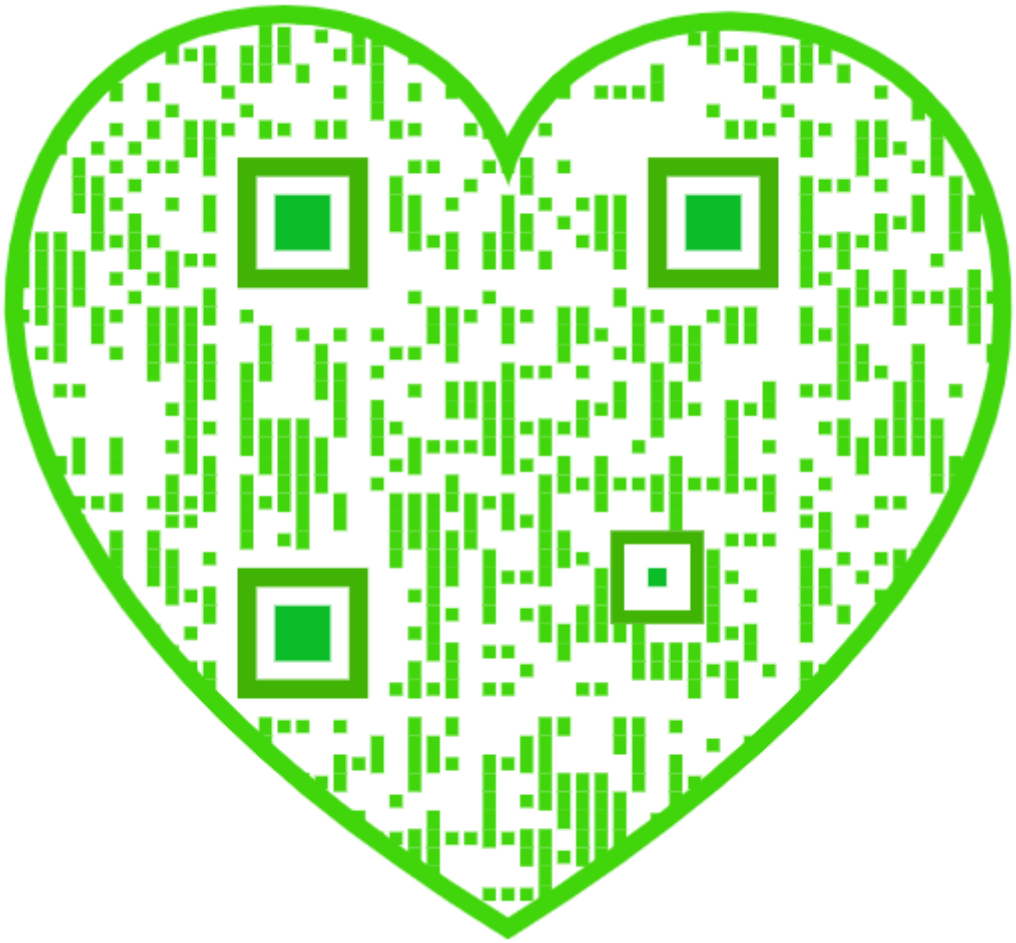

CHEMICAL NOMENCLATURE.

(Continued from page 42.)

Of the seventy elementary substances thus far discovered by chemists, there are only fifteen which make up the chief mass of our globe, and of these the following nine are the most abundant and also arranged in the order of their abundance: oxygen, hydrogen, nitrogen, silicon, chlorine, sodium, aluminum, carbon, and iron; after these follow potassium, calcium, magnesium, sulphur, phosphorus, and fluorine.

In regard to the organic products of the earth's crust, they are chiefly made up (see p. 42) of four substances, namely, carbon, oxygen, hydrogen, and, in many cases, also nitrogen; after these follow, also in the order of their frequency, potassium, calcium, phosphorus, silicon, sulphur, sodium, magnesium, chlorine, iron, and fluorine. It will be seen that the order of frequency is quite different in both kingdoms, the inorganic and the organic. For instance, chlorine, which is the fifth in the order of frequency in the mineral kingdom, is only the twelfth in the organic, and aluminum, so very abundant in the first, hardly ever occurs in the last.

Some fifty-six of the elementary substances possess metallic properties, and therefore are called metals. The remaining fourteen are called metalloids; they are

Oxygen, hydrogen, and nitrogen	Gaseous.
Carbon, boron, and silicon	Solids.
Sulphur, selenium, tellurium, and phosphorus	Combustible.
Chlorine, bromine, iodine, and fluorine	Salt formers.

The other substances are metals, and are again subdivided into light and heavy metals; the light metals of which the specific gravity is less than five, are

Potassium, sodium, and lithium	Alkalies.
Calcium, barium strontium, and magnesium	Alkaline earths.
Aluminum	Earthy metal.

The remaining in the list (page 42) are heavy metals; their specific gravity is more than five. When a metalloid is combined with a metal or other metalloid, the compound was named in such a way that the name of the metalloid was added with the appendage of the affix *atum*; so the combinations of potassium with oxygen, sulphur, phosphorus, chlorine were called respectively, kalium oxydatum, kalium sulphuratum, kalium phosphuratum, kalium chloruratum.

The symbols were founded on these names, and the compounds expressed respectively by KO, KS, KP, KCl. They are in use at the present day, and we cannot sufficiently insist on the fact that these symbols, besides the names, also represent definite quantities of the elementary substances; so KO means 39 potassium to 8 of oxygen; KS, the same amount of potassium with 16 of sulphur; KP, 39 potassium and 31 of phosphorus; and KCl, 39 of potassium and 36 of chlorine.

The Latin names corresponding with the symbols did not however come in use, but have been translated into the different languages, and so, for instance, we call these four compounds in English, oxide of potassium, sulphuret of potassium, phosphuret of potassium, chloruret of potassium. More recently, for the sake of abridgment and uniformity, they have been named oxide, sulphide, phosphide, and chloride of potassium, and the termination *ide* has generally been adopted to denominate all primary compounds, (that is to say, compounds containing only two elementary substances); thus,

The compound of	any substance	with oxygen	is called an oxide.
"	"	sulphur	" a sulphide.
"	"	phosphorus	" a phosphide.
"	"	chlorine	" a chloride.
"	"	hydrogen	" a hydride.
"	"	carbon	" a carbide.
"	"	nitrogen	" a nitride.
"	"	arsenic	" an arsenide.

As the names in the last column differ so little in orthography as well as in pronunciation from the names sulphite, phosphite, chlorite, etc., which latter names indicate compounds of an entirely different nature (as will be explained hereafter), it has lately been proposed by various authorities to drop the final *e* in the names of these compounds, and to write oxid, sulphid, phosphid, chlorid, etc. This termination has been adopted by some writers of the present day, but most text books still retain the final *e* to the names of the primary compounds.

NATIONAL AGRICULTURAL EXPOSITION.

PROGRAMME.

ARTICLE 1. On the 1st day of April, 1869, there will be opened in Santiago in Chili, South America, an Agricultural Exposition, at a locality hereafter to be designated.

ART. 2. The chief object of this exposition is to stimulate as well the landed proprietors of the country as national and foreign manufacturers and importers of agricultural tools and implements, to cause the adoption of the best methods introduced in husbandry, to improve the breed of animals, and to give an impetus to everything that tends to cheapen and perfect production.

ART. 3. The exposition will be especially devoted to agricultural tools and implements and breeding animals; but all such things will be admitted as appertain in any way to rural industry.

ART. 4. The exposition will, in consequence be divided into departments as follows: The first for tools and implements; the second for cattle; and the third for all such articles as serve for the advancement of agriculture—as seeds, wines, oil, dried fruits, timber, models of country houses, household articles, articles of rural economy, dried beef, pulse, liquors exotic and textile plants, etc., etc., etc.

ART. 5. In the department of tools and implements there will be admitted to the exposition, and to the contest for premiums, the following articles;

1. Thrashing machines, operated by animal, mechanical, or steam motive power.
2. Steam motive powers, fixed or movable.
3. Machines for reaping wheat or mowing hay, or for both purposes, worked by oxen or horses.
4. Improved plows of every kind, single and double.
5. Harrows of every kind, both of iron and of wood.
6. Cultivators of whatever form or denomination.
7. Rollers for breaking the soil or pressing the earth.
8. Harrows with movable teeth, drawn by horses.
9. Machines for separating the grain from the ear of corn, sifting hay or straw, or grinding pulse; for crushing grain or oleaginous substances, or triturating them for the food of cattle.
10. Machines for cleaning and separating wheat and all kinds of grain.
11. Machines for winnowing wheat thrashed by horses.
12. Portable agricultural mills, single or double, moved by water, steam, or animal force.
13. Implements for the dairy, and for the making of cheese and butter.
14. Apparatus for pressing grapes.
15. Wine presses, fixed and portable.
16. Distilling apparatus for grains and liquids.
17. Machines for rooting up and breaking the earth.
18. Machines for dressing and combing hemp and flax.
19. Apparatus for irrigation, as pumps, iron sluices, etc.
20. Machines and implements for spinning and weaving silk, and ovens for developing the eggs of the silkworm.
21. Bees and all utensils relative to the care of bees.
22. Machines for sawing wood.
23. Machines for dressing hay, straw, wool, charqui, etc.

ART. 6. In the cattle department there will be admitted, under the same conditions as for tools and implements, the following species and types:

HORNED CATTLE.—1. Animals indigenous to the country, of one, two, three, and four years of age; 2. Cattle imported from abroad, or born in the country of pure breed; 3. Cattle produced by a cross with the indigenous race, from the age of one year upwards.

WOOL GIVING ANIMALS.—1. Mixed ewes only of the Pe huenche breed; 2, Mestizo sheep of the first, second, and third crossing; 3. Merino sheep, pure English, Rambouillet, Negreti, or other sheep; 4. Native, foreign, and mestizo goats.

SWINE.—Swine of the pure race of the country, or swine produced by a cross between both.

HORSES.—Horses and mares of indigenous or foreign stock, carriage, riding, or race horses, and horses for the general use of the country in farming operations.

ASSES.—Asses of native or foreign breed.

ART. 7. In the department of general agronomy, there will be admitted seeds, fruits, wines, woods, birds and domestic animals, plants, hides and skins, butter, wool, wax, honey, hemp, flax, oleaginous seeds, models, plans, and all articles whether of artificial or natural production, which do not appertain to the two preceeding departments, and which in any way tend to the improvement of agriculture and the welfare of the rural classes, in the judgment of the commission having charge of the exposition.

ART. 8. Each one of these departments will be under the charge of a special commission, which will nominate the proper judges for the examination of the animals and articles entered for exhibition, and will award the respective premiums.

ART. 9. There will be five classes of premiums special for the purposes hereinafter expressed, and which will be awarded by the different commissions combined into one.

1. A grand medal of honor and a premium of eight hundred dollars (gold), which will be awarded to the national or foreign manufacturer or manufacturing company that shall present the greatest number of machines, apparatus, or instruments of agriculture which, combined, shall be deemed to produce the most perfect results, and which, in the judgment of the commission, shall be entitled to the premium. But in this case the articles must be proved to have proceeded, and been sent directly from the manufactory in question.

2. A premium of the first class, which will consist of a gold medal and $500 (gold), for the thrashing machine that shall deliver the grain in the cleanest condition, and render the greatest quantity in a given time, regard being had for the relative power of the motor, the size of cylinder, and other conditions which it may be proper to take into consideration. There will be a second premium, which will consist of a silver medal and $300 for this class of machines, which will be awarded according to the discretion of the commission.

3. A gold medal and $400 (gold), for the best winnowing wheat thrashed by horses, and which, in the judgment of the commission, attains the object for which it is intended.

4. A gold medal and $5 (gold), to the exhibitor who in the judgment of the commission, shall offer the largest and best number of producing animals of the different classes and types already mentioned.

ART. 10. All the other apparatus or instruments will be classified by the special commissioners to be appointed, in different classes, according to their character and variety, or the quantity of each kind that may appear in the Exposition; and those that deserve premiums in each class will have awarded to them medels of gold and silver, and premiums ranging in value from $10 to $200 (gold).

ART. 11 The rewards for the exposition of breeding animals of the different kinds above designated, will consist of medals of the first and second class, those of the first class being of gold, and those of the second of silver, and in pecuniary premiums from $20 to $150 (gold), in value according to the kind to which they belong, and such as, in the judgment of the jury, may be entitled to such premiums.

ART. 12. The fruits of the country, which, in the opinion of the proper committee, shall merit some reward, will receive it in medals of silver or gold, or premiums in money to the value of $50; but it is proper to notify those interested that such fruits must be produced in sufficient quantity to render them objects of consideration.

ART 13. In addition to the gold and silver medals and pecuniary rewards, there will be given medals of bronze, whenever the commissioners deem any one of the various exhibitors entitled to this reward.

ART. 14. No object shall be admitted to the exposition which, in the judgment of the commission charged with the management of the exposition, ought to be rejected as not fulfilling the required conditions.

ART. 15. Every person who desires to take part in the exposition should at least two months beforehand, communicate in writing to the committee having charge of the exposition his intention of being one of the exhibitors, designating at the same time the article or articles which he wishes to present and the quantity thereof, in order to have the proper space reserved, and to make the necessary arrangements for the best and most convenient location with a previous knowledge of all the articles destined to figure in the exposition. Those who do not comply with this requirement will have no right to be admitted to the exposition.

From this condition are excepted manufactured articles and animals brought from abroad, which will be admitted up to the day preceding that of the opening of the exposition, and will be entitled to premiums like the former.

ART. 16. All articles intended to appear in the exposition ought to be sent punctually, at least fifteen days before the day fixed for the opening of the exposition, except the animals, which should be entered at least three days before the opening.

ART. 17. A special regulation, hereafter to be published, will determine the days on which the trial of the various machines is to take place, as well as everything else concerning the arrangements of the objects that may be transmitted, and all the necessary preparations for the realization of this programme.

(Signed) FRANCISCO ECHAURREN, SANTIAGO PRADO, DOMINGO BEZANILLA, MANUEL BEAUCHEF, RUPERTO OVALLE, BENJAMIN ORTUZAR, BENJAMIN VICUNA MACKENNA.

Santiago, April 30, 1868.

Any additional information desired can be obtained by addressing Mr. Sanches Fontecilla, Chilian Minister, Washington, D. C.

Floating Water Wheels for Siam.

The practice of utilizing the power of the tides has just been applied to pumping purposes for the king of Siam by English engineers. The first of a series of wheels is completed for supplying water to the king's palace at Bankok. It recently received a preliminary trial on the river Thames. It was fixed on a wrought iron punt sixteen feet long, five broad, and two feet six inches deep. The wheel is five feet diameter, with paddles two feet broad, and working treble two-inch plunger pumps of nine inch stroke, and fitted with India-rubber disk valves. The engineers were consulted by the king of Siam, with reference to supplying the four grand palaces at Siam with water, and not finding sufficient fall from which to obtain motive power adopted the plan of tidal wheels. The velocity of the scream ranges from two and one half to four miles an hour—about the same flow as on the Thames –and the apparatus will have to force water a considerable distance to a height of over a hundred feet. This in a recent trial on the Thames it proved itself quite capable of doing, working equally well on each change of the tide.

A New Pleasure Vehicle.

Hitherto the velocipede has been considered a mere toy for the amusement of children, but at the present moment this vehicle has produced a fashionable mania in Paris among both sexes, and it is very likely to come over to us. Why should we not adopt the velocipede as a pleasure carriage? It appears that a "veloce club" of sixty members has been organized in Paris, at the head of which is Monsieur de Vesin who has made a considerable wager that he can out-run the swiftest horse of Prince Murat. M. de Vesin has recently made the journey from Angers to Tours a distance of sixty-four miles, where his velocipede broke down. A first class race is soon promised to come off at the Bois Boulougne. The Paris velocipede is sometimes constructed of two large wheels, one following the other, and connected so as to provide a comfortable seat for the rider who adroitly balances himself and at the same time guides and propels the machine by his feet, Generally however three large nicely balanced wheels are used, and with a powerful crank and easily working levers, the machine is propelled along with the greatest apparent ease and at high speed.

Velocipedes are very common upon the streets of Paris which have smooth pavements, and can be used anywhere in our parks and upon good country roads, therefore we expect very soon to witness their introduction into this country, The exercise is graceful and healthful.

Cheap Ice Pitcher.

We republish, it being seasonable, the following simple method of keeping ice water for a long time in a common pitcher or jug. Place between two sheets of paper (newspaper will answer, thick brown is better,) a layer of cotton batting about half an inch in thickness, fasten the ends of paper and batting together, forming a circle, then sew or paste a crown over one end, making a box the shape of a stove-pipe hat minus the rim. Place this over an ordinary pitcher filled with ice water, making it deep enough to rest on the table, so as to exclude the air, and the reader will be astonished at the length of time his ice will keep and the water remain cold after the ice is melted.

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CARBOLIC ACID.

A lecture delivered by Dr. Crace Calvert, before the Society for the Encouragement of Industry in France, contains most important details of the manufacture of carbolic acid, and its application in the arts. We shall endeavor, as briefly as possible, to give an abstract of the facts embodied in his lecture concerning this substance, which is attracting increased attention as its applications become more numerous and important.

When coal is heated to a dull red in a retort, gaseous products, water containing ammonia and salts of ammonia, and coal tar are distilled over, coke remaining in the retort. Carbolic or phenic acid is extracted from coal tar. Laurent was the first to discover an easy method of separating carbolic acid from the substances with which it was mixed and combined. His method was to submit the light oils obtained from the distillation of coal tar to fractional distillation, and then to treat those which distilled off between 160° and 200° C. with a strong solution of potash. This process was improved upon by Mansfield and Bobeuf, who treated with caustic soda the whole of the light oils, instead of a portion as Laurent had done.

The acid thus obtained was very impure, but it was found to be of great use in the production of picric acid, in preventing the transformation of tannic acid into gallic acid, in the process of tanning, and in the preservation of subjects in the dissecting room. M. Bobeuf also applied it to the preservation of other organic substances from putrefaction.

In 1859, Dr. Calvert discovered that a better way to obtain carbolic acid was to treat the impure benzines or naphthas of commerce with *weak* alkaline solutions. By this means he obtained a semi-fluid blackish product, of a density of 1.06 which contained 50 per cent of carbolic acid. Still further experiment resulted in the production of the crystallized acid of considerable purity, but the tarry and sulphurous smells which remained were serious obstacles to its use in medicine. In 1864, the firm with whom Dr. Calvert was connected succeeded in removing the sulphurous smell. The acknowledged therapeutic value of carbolic acid had already attracted the attention of medical men, and from this time its use in medicine and surgery became largely increased. Since that time, however, the Messrs. Calvert have also succeeded in producing an acid entirely freed from disagreeable odors and tarry flavor, and as pure as that obtained by the processes of Wurz and Kékulé, or that which is obtained from salicylic or nitrobenzoic acid.

This acid differs from Laurent's in its solubility, its fusibility, and the tempera- ture at which it boils. It requires 20 parts of water for its solution, fuses at 41° C., and boils at 182° C. Laurent's requires 33 parts of water for its solution, fuses at 34° C., and boils at 186° C.

From the fact that Laurent's acid had a constant boiling and crystallizat ion point, it was formerly supposed to be a pure and definite substance. The production of this new acid shows it to be only a mixture of carbolic acid and a liquid homologue ; for when a certain proportion of water is added to Laurent's acid. and the mixture is allowed to stand at a temperature of 4° C. it deposits a crystalline substance in large octahedrons. This substance is a hydrate of carbolic or phenic alcohol, that is, carbolic acid combined with an equivalent of water of crystallization—the only example known of an alcoholic hydrate in a crystalline form. By removing the water from this hydrate, carbolic acid is obtained in its purest state.

The applications of this substance for sanitary purposes in medicine, agriculture, and manufactures are already extensive, and are likely to be rendered of much greater importance than at present. As a disinfectant and antiseptic it is exceedingly efficacious. It acts directly upon the microscopic vegetation and animalcules, to the presence of which fermentation and putrefaction have been attributed, destroying them and thus neutralizing the effect of their diffusion, through the atmosphere. It is superior for this purpose to chlorine, permanganate of potash, or Condy's fluid. The latter substances act indiscriminately upon all organic substances with which they come in contact. Carbolic acid, on the contrary, only acts directly upon the causes of putrefaction. A very small quantity of it is required to prevent decomposition, it is therefore economical. Being volatile, it meets with and destroys the germs and sporules which vitiate the atmosphere,—a property possessed by none of the above mentioned disinfectants except chlorine. It was therefore used with great success in England, Belgium, and Holland, during the prevalence of the cattle plague and the cholera. Dr. Calvert stated that ·001 or even ·0002 would prevent the decomposition, fermentation, or putrefaction of urine, blood, glue solution, flour paste, fæces, etc., for months. Its vapor alone will preserve meat in confined spaces for weeks, and protect it from flies. Sewage may be kept free from fermentation by the use of .0001 part. The British government have desided to use it exclusively in the navy and other government departments.

In medicine, besides its properties as a disinfectant, its caustic properties are found beneficial. It is used with benefit in cases of carbuncle, quinsy, and diphtheria ; hæmorrhoids, internal and external fistula, and other similar complaints. In surgery it is applied with great success to purulent sores, preventing the disagreeable smell which issues from them, and keeping them in a healthy and cleanly condition. It has also been found of great service in cases of syphilis and phthisis.

In agriculture it has been found of the greatest use in the treatment of diseases common to sheep. Scab is cured by dipping the sheep in water containing a small portion of the acid, and allowing it to remain about one minute. For this purpose the pure concentrated acid is too expensive, and an emulsion of the crude acid in soap and water is to be used instead. A bath containing .017 of it is sufficient to effect a cure. For foot-rot an ointment should be made of the crude acid and grease, placed in a shallow stone tray, and the sheep driven through it. If cattle or horses are annoyed with flies or other insects, a weak solution of carbolic acid rubbed through the hair will be found an effectual protection.

In manufactures, this substance has been successfully applied to the preservation of wood, hides, and bones designed for shipping to great distances, in the preservation of guts at the gutworks, the preparation of anatomical subjects, and the preservation of all animal matter. It is also used to prevent the decomposition of gelatin and albumen, used in spinning, dyeing, and calico printing.

It is used in the manufacture of certain beautiful colors, very much resembling the famous aniline dyes, and in the manufacture of picric and picramic acids. We have not space for the enumeration of all the uses of carbolic acid, as given by Dr. Calvert, who, in closing, expressed his regrets at being unable to give in a single lecture, all the important applications of this valuable agent, which, after having rendered important services to most of the world's industries, still offers to chemists and to manufacturers a wide field for new applications.

Matters at Quarantine---The West Bank Hospital Buildings.

Ever since the memorable "Sepoy" riots of 1858, in which the old Quarantine establishment at Staten Island was destroyed by a mob, many of them, by the way, gentlemen of property and standing, the important business of quarantine has been carried on in temporary and floating accommodations. In 1865 Dr. Swinburne, the present efficient Health Officer, was appointed by Governor Seymour, and in the following year, mainly through his energetic efforts the Legislature despairing of obtaining from the State of New Jersey the coveted site of Sandy Hook, authorized the erection of Quarantine buildings on the West Bank, a well known shoal in the lower bay, at a point some fifteen miles from this city. The work was not commenced, however, until March, 1867, when the board, vested by the act with power in the premises, viz., Messrs. Curtiss, Cobb, and Anderson, with the Mayors of New York and Brooklyn *ex officio*, contracted with Mr. Frank Swift for the structure, which has since been vigorously proceded with.

The shoal at West Bank is even at low tide from seven to nine feet below water, and being composed of soft and shifting sand, grave doubts were felt whether the erection of a permanent structure on such a site was a practicable feat of engineering, and the progress of the work has been watched with much interest. The experiment bids fair to be entirely successful.

The first step in the undertaking was the construction of cribs of the heaviest timber. These were floated to positions designed to form the exterior line of the structure, and then sunk by being filled with stones. Other cribs were in like manner sunk upon them, and in this way a solid wall has been formed, 25 feet in hight, 30 feet in width at the bottom, and 20 feet on the top. The cribs thus sunk form a six sided wall 1,300 feet in length, in its exterior line ; and 240 feet in its greatest width, and enclose an area of about two acres. The space thus enclosed is then filled with sand dredged out from the neighboring shoal, and heavy stones are then thrown into the sea around the exterior of the crib, forming what is termed a "rip-rap" wall, which is designed to be carried up to a level with the summit of the structure, which, it is claimed, will thus be rendered permanent and indestructible. Some 53,000 cubic yards of sand, and 23,000 yards of stone will be required to complete the work, which is now more than half done. The work is to cost, by contract, $310,000. On the plateau thus constructed, which will be about 12 feet above high water mark, six ranges of one story hospital buildings, capable of accommodating about 1,000 patients, are to be erected, and a landing pier some 400 feet long constructed to the ship channel. Another similar structure will be built at a point about three quarters of a mile to the north, which will be used to accommodate the healthy passengers taken from infected vessels. It is much to be desired that the experiment should prove successful, as it will in that case solve at once the tangled quarantine question and sundry weighty problems in engineering. Depots for infected cargoes will probably be erected at a point in the upper bay.

The hospital steamships Falcon or Nightingale and Illinois are now moored at a point near the West Bank, ready for the reception of yellow fever patients, who are expected shortly to arrive in considerable numbers. They can conjointly accommodate some three hundred patients. They are models of neatness, and in their cool and breezy anchorage furnish at this season a really delightful accommodation for the sick.

Dr. Swinburne is entirely confident that with the new structures completed all infectious and contagious diseases can absolutely be held at bay at the entrance of the harbor.—*Sun.*

AT a recent foreign meeting of the Society of Friends, many of the most influential members expressed their wish that the denomination might more actively and generally cooperate with the efforts of the Peace Society ; and in lamenting the increase of military armaments of late years, one of the speakers dwelt particularly upon the condition of the France, where nearly eight hundred thousand men are compelled to lead the demoralizing life of soldiers, being withdrawn from useful civil industry and taught only to slaughter and destroy their race. Another member, from Maine, stated that $1,250,000,000 are annually expended upon military armaments by Christian nations, while hundreds of thousands of their citizens are suffering from misery, ignorance, poverty and starvation.

Editorial Summary.

DURING the present warm weather attention should be specially directed to whatever may have a tendency to produce disease. The basements of houses situated in the very best localities often contain dust bins, drain pipes, and other matters in so neglected a condition that they may at this season prove very prolific sources of fever and diarrhea. Particular care should be taken to prevent the admixture of vegetable and animal matter with the cinder ash. A means of obviating this, and of counteracting the lazy, extravagant habits of domestics, who rarely sift the cinders, is to provide the dust bin with an iron grating made to fit the top like a lid and having a padlock to prevent removal save at the time when the dust is to be taken away by the carts. This will be found by householders to promote both health and economy. The grating being small, or sufficiently fine to permit only the dust to pass through, the cinders will remain on the top, and can there be collected and replaced in the coal scuttle. Cisterns should be examined and all sediment and deposit at once removed, for at no other time of the year is pure water so essential to health, or impure water so certain to cause illness. As a disinfectant, we cannot mention a more effective agent than carbolic acid, the nature and properties of which have been noticed before in our columns, and are very fully treated in another place in our present issue.

WHAT MODERN CHEMISTRY CAN PERFORM.---The chemist takes a quantity of Sombrera guano, mixes it with sulphuric acid, and the result is an excellent manure. If instead of converting this substance into material for the practical agriculturist, he extracts phosphoric acid therefrom, this acid can be made to give the igniting property to lucifer matches. So the same article that will aid in producing wholesome, strength-giving food for man and beast, will also afford a light for the cigar of the fop ; it can build up the hay rick and corn stack, or form a principal component of the instrument with which the incendiary burns them down. The farmer rejoicing in his plentiful harvest and fat cattle, the street Arab who sells matches at ten cents a box, and the housewife as she kindles the kitchen fire and prepares the daily food, may thus be dependent for the success of their labors upon a sea bird inhabiting a lone rock in the ocean.

A RUBBER CARRIAGE.—A carriage has been made in Bridgeport, Conn., which is an open buggy and weighs but 125 pounds. The body is one piece of hard rubber, one eighth of an inch in thickness. It is without the usual carriage bolts and screws, and presents a perfectly smooth surface, which is not soiled or tarnished by rubbing or by handling. The rubber is tougher than wood, and very much more elastic. The running gear is of wood, but the next carriage made will be entirely of rubber. The material is unaffected by wet, hot or cold weather, and was prepared at a temperature of 300 degrees, the body having been first got into a plastic mass, like dough. A company has been formed, called the "Hard Rubber Wood Company," with a capital of $250,000, and consisting of fifteen stockholders, for the purpose of carrying on the business in Bridgeport.

ORNAMENTAL METALLIC TUBES.-- Ornamental metallic tubes are now manufactured in the following manner : A tube or foundation of wrought iron of the required strength, is placed in a tube of thin brass, and by a drawing process, conducted in the ordinary manner, the iron tube is coated with brass. Ornamental figures are then impressed upon the surfaces by passing them through engraved rollers, after inserting a steel mandril into their bores to prevent compression. On being removed from the mandril the ornamental tube resembles a solid brass tube.

WHETHER the "grip" of the horizontal brake wheels of the Mont Cenis Railway will be seriously affected in winter by the hard frosts remains to be proved, but at this season Mr. Fell's railway transports one in a far pleasanter manner over Mont Cenis than the dilligence. Six hours and twenty francs a head are saved by it, to say nothing of the greater comfort and less fatigue, and as soon as the communication has been established throughout Italy, any one may leave London at 7:30 A. M. on Monday and dine at Rome on Wednesday, to say nothing of breakfasting at Naples on Thursday morning, if such rapid motion should suit him.

AGRICULTURAL EXHIBITION IN CHILI.—We call attention to the programme published on another page of the particulars concerning the above exhibition. Some of the circulars before issued announced that it would open on the 15th December next. The time has been changed to April 1, 1869, which will enable our agricultural implement makers to send on their productions.

HENRY LEWIS, an American artist residing at Dusseldorf, Prussia, has been appointed U. S. Vice Consul for that city. Mr. Lewis has been a faithful friend of our countrymen visiting that place, and is in a position to execute any art commission that may be entrusted to his care.

THE Prussian government has authorized the Krupp firm at Essen to execute a considerable order of cast steel guns for the Russian military administration. Russia intends to transform all her artillery into the Prussian pattern.

ENGLISH AND AMERICAN REAPING MACHINES.—By the cable we learn that at a trial which took place in Germany, July 11th, the English reapers bore off the international prize.

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THE USE OF EXPLOSIVE PROJECTILES.

Communicated.

The Russian government has issued a circular calling upon foreign powers to adopt unanimously a new regulation, calculated, it is supposed, to mitigate the horrors of war. Hollow projectiles have been devised suitable for small fire-arms. These balls are filled with fulminating material, and in bursting are said to produce effects much more terrible than those of ordinary bullets. Experiments, rather extensively conducted, have proved that these shells can be fired from muskets with the same facility as those of a larger size can be discharged from cannon. As yet these projectiles have been directed chiefly against wild beasts, and basing its statements, let us trust, upon this use of the new shells, the Russian document says, "An explosive bullet of this description splits into ten or more fragments, and in case of the explosion occuring in a man's body the wound is most painful and mortal. Moreover the fulminating matter seriously affects the organism of the human frame and needlessly increases the suffering." The disabling of an enemy, it argues, not the infliction of agony, is all that is desired in actual fight, and the use of these bullets is therefore unnecessary and barbarous.

Whatever may tend to the mitigation of suffering in war is certainly most desirable; but, while we are inclined to give all due credit to the humanity of sovereigns and rulers in general, and of the Czar in particular, we very much doubt that this appeal to the heart will have any weight in deciding the acceptance or rejection of the proposal. So long as evil passions exist among individuals in private life, and these passions, acting on a larger scale, tend to produce distrust, antipathy, and war between nations, a wider and more comprehensive view must be taken of the case. At present the ability to undertake and sustain a war is considered the surest guarantee of a nation's peace. In war it is a received axiom that offence is the best means of defence. If, then, it could be proved that a body of men provided with this kind of ammunition could send more certain and rapid destruction into the ranks of enemies than they would be able to do if furnished with the usual kind, feelings of humanity for the after sufferings of the fallen would not ultimately call forth any prohibition of its use. We think there are certain objections, however, which stand in the way of these shells being extensively employed in warfare. Their use involves more caution and difficulty than that of the common projectile. Numerous unavoidable situations will readily occur to the mind where they would be more dangerous to friend than foe. Again, considering the nature of their structure and composition, it is not easy to see how they can be well employed with the needle gun. Taking these practical disadvantages into consideration, it will readily be perceived how the benevolent sentiments of those who wage war at the expense of their fellow men can remain undisturbed in deciding upon the rejection of these missiles; and no doubt the sagacity of the Emperor of the French led him at once to perfectly comprehend the matter in all its bearings, when with his accustomed policy he so promptly forwarded his assent to the proposal of Russia.

Over and above what at first meets the eye in this proposal, taken in connection with the general acquiescence which will be probably given to the proposition, it seems to us to have an important significance. On sea and land the art of war has arrived at a high degree of perfection. Ships, guns, and war material as a whole have been so altered and improved under the labors of the engineer, the chemist, and the machinist that war is no longer so much a matter of chance as to amount to an exciting national diversion. Death now reaps too enormous a harvest with awful certainty and speed. for nations to sacrifice in war their youth and strength and intelligence on any other ground save the preservation of life, liberty, and national existence. Aggressive wars tend now to something else than the mere gratification of pride and ambition. Princes and potentates are beginning to have these facts forced upon their attention, and, to put it in rather homely but expressive terms, are learning to calculate the "cost of the candle" before venturing on the game of war. Let inventors go on perfecting implements of destruction and devising new ones, for humanly speaking, we know of no other means which can so powerfully operate in showing the folly of armies meeting for slaughter, and forestall in some degree the time when men shall learn the art of war no more.

Artificial Granite.

A method of manufacturing artificial granite has recently been patented in England. The materials of this artificial granite are disintegrated natural granite mixed with clay, together with pounded glass, lava, and iron slags. The disintegrated granite is obtained by submitting fragments of natural granite to a strong heat, about 700 deg. or 800 deg, C. in an oven, by which after a sufficient time, it becomes dissolved into a granitic sand, the constituent parts of which, quartz, or feldspar, possess great powers of adhesion. One part of this granitic sand is then mixed with an equal quantity of pounded glass, or the constituents of glass, or lava, or iron slag, to which is added from twenty to thirty parts of refractory clay, or from thirty to fifty parts of ordinary clay. This mixture is thoroughly kneaded together with a sufficient quantity of water to make it of a pasty consistency. It is then molded to any form required, and submitted to a degree of heat sufficient to vitrify the mass for about thirty-six hours, which converts it into a durable substance resembling granite. The artificial granite thus produced may be molded into any forms required to render it suitable for various kinds of buildings, fortifications, docks, and other engineering structures, and particularly for all kinds of pavements, for which its great hardness renders it particularly suitable. When very large blocks are required, it is preferable to make them hollow, and, after they have been baked or burnt, they may be filled with concrete, rubble, &c., to make them solid. Any kind of furnace in which the requisite heat can be generated will answer for dissolving the granite and baking or vitrifying the blocks or bricks; but Mr. Parsons finds Hoffman's annular furnaces performs this operation satisfactorily.

Correspondence.

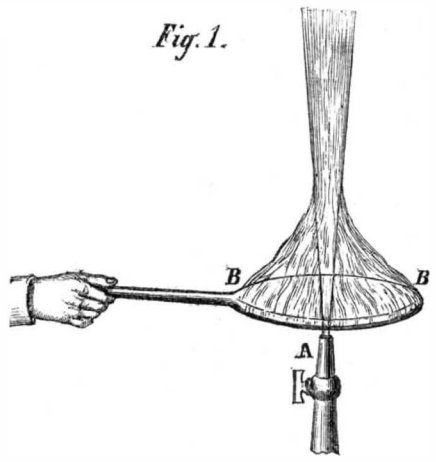
The Editors are not responsible for the opinions expressed by their correspondents

Faraday on the Ball and Jet.

Messrs. Editors:—The following is an extract from an English work:

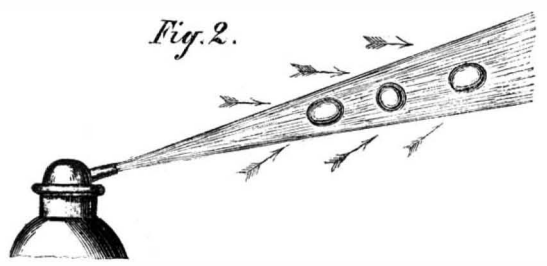
Faraday found that "if steam, at a pressure of about sixty pounds per inch, is allowed to escape from a proper jet, and large lighted circular torch, composed of tow dipped in turpentine, held over it, the course of the external air is shown by the direction of the flames, which are forcibly pulled and blown into the jet of steam with a roaring noise, indicating

Fig. 1.



the rapidity of the blast of air moving to the steam jet." A, in the sketch, (Fig. 1,) is a steam jet, B B, the lighted torch, held around the escaping steam—the flames all rushing into the steam. Egg shells, empty flasks, India-rubber, or light copper and brass balls are suspended in the most singular manner inside an escaping jet of high pressure steam. Sin-

Fig. 2.



gular is the fact that the jet of steam might be inclined at any angle between the horizontal and perpendicular, and still hold the ball, egg shell, or other spherical figure, firmly in its vapory grasp, as shown in Fig. 2, C being a ball and socket to incline the jet. X. X.

Syracuse, N. Y.

The Influence of Color on Vegetation.

Messrs. Editors:—It is a well-known fact, that if growing plants are excluded from light, though not from air and moisture, they will become nearly or quite colorless, or of a pale yellow hue; and on the other hand, it is equally true that the foliage of nearly all healthy plants and trees, growing in the sun-light, are of one universal color, viz., green, with its various shades. Now as there are in white light but three primitive colors (red, yellow, and blue), and two of them (yellow and blue) are reflected from the surface of the leaf, forming green, it would seem that the color which is essentially a benefit to plants is that which they absorb; or red. Red and green, as well as orange and blue, yellow and violet, form white. This, I think, is a subject on which some interesting experiments might be made by any who has the necessary time and facilities. Make, say, seven small square sashes in the sides of which panes of glass may be inserted, each of one of the following colors, red, orange, yellow, green, blue, violet, and one of common glass; these with covers of the same (but no bottoms) may be placed over beds of plants, forming miniature hot-houses, and the result of the experiment watched. Perhaps young peas would be best to experiment on.

Theoretically, red would be nearest to, purple or orange next, and green farthest in effect from the natural growth.

One other substance—blood—is always of the same color. It seems that vegetable life needs red, and animal life green light, in the same manner that the former needs carbon, and the latter oxygen; in both cases, each giving of that which the other requires. The natural abode of man and other land animals, the forests, and even the sea, is of a greenish hue. As plants through the night are said to reverse the process of giving off oxygen and absorbing carbon, it may be that the red light of day prepares the surface of the leaf for the reception of carbon or the generation of oxygen, thus becoming an active agent in the production of vegetable growth. I should be pleased to have the opinion of the Scientific American on this, which I think is a subject deserving of more attention than it has received. Spectrum.

Havana, N. Y.

[We can hardly agree with our correspondent that red is the color essentially beneficial to plants. Timbs, in his "Curiosities of Science," says that experiments on hyacinths grown under the influence of various lights, proved that the yellow ray diminishes the growth of the rootlets and the absorption of water, and the red ray hinders the proper development of the plant. The blue rays retard germination at first, but accelerate the growth of the plant afterward; the act of germination being attended with absorption of oxygen, but the process of development, on the contrary, being attended with the extrication of this gas.

The experiments recommended by our correspondent are inexpensive, and easily made.—Eds.

Imperium in Imperio.

Messrs. Editors:—"A house divided against itself cannot stand." If this is true it seems that our industrial fabric is liable to overthrow. We see that, in spite of the basis of our government, as shadowed in the Declaration of Independence, in which it is stated that all men have an innate right to the pursuit of happiness, we are prevented from that pursuit by the interference of the members of combinations, who seem to suppose that the pursuit should be undertaken in only the paths they themselves have marked out. I believe I have a perfect right, in this country, to pursue happiness, *i. e.*, to do my own business, in my own way, without interference from any man, or set of men, if I do not infringe upon the rights of others. Believing thus, I have so acted. Conducting a business which necessitates the employment of workmen, I have employed men and kept them in work at fair wages, without caring to inquire whether they belonged to some trades union or not.

But a "change came o'er the spirit of my dream." My men, who had perfectly satisfied my demands, and always done their work well, one by one left me without any satisfactory reason. I found great difficulty in filling their places, and at length my eyes were opened by the receipt of several threatening anonymous letters, containing the information, that if I wanted workmen I must take members of the trades union at a fixed price per day, without regard to the qualifications of the workmen, or it would be "the worse for me." Paying no regard to these threats, and determined to do my business in my own way, without permitting outside and unwarrantable interference, I again attempted to employ hands to work at my business. I found my steps dogged and my efforts hindered and forestalled by members or agents of this trades union, even my personal safety being threatened in the streets.

Now, if we have a government in a government, an authority beyond the general law which shall compel men to obey its behests rather than depend upon the protection believed to be afforded to all good and peaceable citizens by the law, it is time it should be known, and a remedy applied. I hold and acknowledge no allegiance to any government but that of the state and nation in which I reside, and repudiate all attempts of bogus authorities, in the shape of trades unions, to regulate my business or the terms I make with my workmen. I want merely the common liberty of doing my business in my own way, and paying out my money as best for my interest and for the good of my workmen, both of which, I think, I can manage for myself and them, better than any association can manage for me. My business concerns myself and those who work for me—nobody else—and I shall not submit, in this land of personal freedom, to any dictation from unauthorized outsiders as to the method of managing my business.

I think it is time that something should be said by influential papers, as the Scientific American, in regard to this subject. This assumption of power and interference with private, personal rights by irresponsible and self-constituted arbiters of questions between employer and employed, has assumed such proportions in its interference and dictation between employing capital and employed labor, that it has become a question whether an individual has a right to the employment of skill, or even the use of his own hands without the consent of combinations whose practices are unquestionably illegal.

These unions and associations assume too much when they insist on dictating, not only the amount of wages to the employé, *but the person to whom the employer may give work.* The employer is not only the best judge of the qualifications of his workmen, but he is also the best judge of the amount each earns, and also of the advantages of one workman over another. As to his ability to know his own business—that is, his profit and loss—I presume, on this point, there can be no question. Crispinus.

New York city.

Modern Naval Warfare.

Messrs. Editors: — Mr. Holley, of Harrisburgh, Pa., might have given one more important invention to the credit of one of the Stevens family, namely, the Armstrong time and percussion fuze; the fuze being ignited by the liberation of a plunger held in position by a wire or its equivalent on the shock of concussion by explosion of discharge, when the plunger acted on a fulminate attached to the time fuze. This invention forms the basis of the Armstrong fuze and of all the time and percussion fuzes used during the late war, except a few used on the "Splingard" principle. Nearly two years ago I discovered at Fort Monroe, among the papers of Mr. Couch, master carpenter, a detailed drawing in sections of this fuze and which bore the names of two witnesses and date 1831. A copy of the original is in my possession. I afterward found in the Washington Navy-yard Museum, a perfect brass fuze of the same make, and the officer informed me that it was left there many years ago by one of the Stevens family. I called the attention of the army ordnance department to the fact when I made the discovery. No records of

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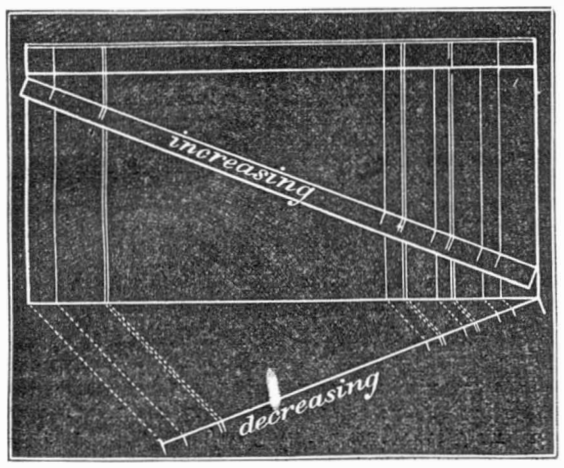
the experiments with it could be found, but Mr. Couch was present when the experiments were made. It is strange that the navy department should so far neglect the interests of American inventors. The Armstrong fuze is, doubtless, more perfect in construction, but the principle is the same in both. Sir William Armstrong was handsomely paid by the British government for this invention. THOMAS TAYLOR.

New York, June 29, 1868.

Reducing and Expanding Lines.

MESSRS. EDITORS:—I send herewith a simple mode of changing the scale of any pattern of ruling. You will see that it provides both for increasing and decreasing the scale while preserving the proportions. I cannot think that a



thing so simple could have escaped the notice of professional men, yet I have never met one person who knew it. Perhaps if given in your excellent paper it may interest some of your readers. J. S. B.

Springfield, Ill.

[This method of reducing or enlarging lines we had supposed was too well known to require a published example, but we find frequently that many items of useful knowledge, long in use, are new to our correspondents, and at the risk of being considered behind the age we reproduce them as a means of instruction.

In the diagram the parallelogram may be considered a sheet of paper ruled. If it is desired to rule another but wider sheet, preserving the same relative proportions, it may be done by placing a slip diagonally across the sheet and marking on it the points where its edge intersects the ruled lines, then placing it squarely across the wider sheet, and ruling from the points as marked. For instance, if the original sheet is six inches across and the proposed sheet nine inches across, cut a strip nine inches long and place it on the six-inch sheet at such an angle that its ends shall agree with the edges of the sheet, then make the marks and transfer to the nine inch sheet. The contraction is done in reverse order, as shown by the diagram. It is evident that this plan is applicable to many uses. Draftsmen and others who use pen and pencil know its value.—EDS.

Adjustable Gears--Gears Without "Backlash."

MESSRS. EDITORS:—In Vol. XVIII., No. 15, page 228, there is a call for the invention of a gear which shall have no "backlash." I have been experimenting since that time, and think I have overcome this objection. It is evident that whatever be the form of the tooth, there will be "backlash" after the gears have become worn. I have resorted to a double arrangement to accomplish my purpose. Fig. 1 represents a section of this gear; A represents the gear proper and B a ring fitted to A and secured to it by the bolts, C, which pass through slotted holes. The proportionate width of the face of the gear and the face of the ring may vary with the amount of work to be done by each. Fig 2 is a side view of a section of the gears. The letters are applied to the

Fig. 1

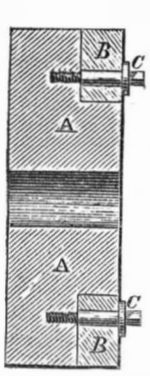
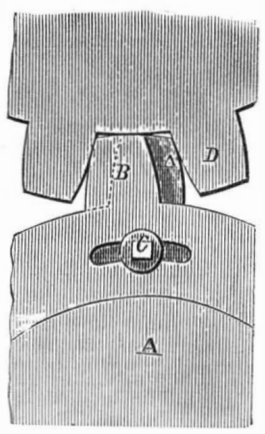


Fig. 2



same parts as in Fig. 1. The ring, B, with teeth on it the same as the teeth on A, being adjustable, can be moved about the center of A, sufficiently to make the teeth on A touch one side of the space between two teeth on a gear with which it meshes, while the teeth on B touch the opposite side of the same space. Only half the gears of a train need be of this kind. D is an ordinary gear, the teeth of which mesh with those of A. J. M. M.

[Objections will be raised to this method of overcoming the play or backlash of gearing because of its cost and its difficulty of adjustment We give, however, a diagram of our correspondent's plan, as in some circumstances the device may be found available and perhaps efficient. We have lately seen a gear which we consider superior on account of its cheapness, and fully as efficient. It is simply a double or treble gear, the teeth of which interpose with the spaces, so that when one relaxes its hold the others engage and keep up a thorough and intimate connection. The wear, alluded to by our correspondent, being divided among two or three sets of teeth, is very little in the aggregate, and the action of the teeth is very smooth and even.—EDS.

Eyeless Axes.

MESSRS. EDITORS: Reading an article, in your paper of the 1st, on the manufacture of edged tools in the United States, reminded me of a story which may interest some of your readers. My authority for its truth is a member of the Chicago Board of Trade, who stated that he had *seen* several of the "tools" which were the heroes of his tale, that runs as follows :—

"When the great Eastern Rail Road from Michigan to Detroit was being built, the manager of the work, having a just sense of the superiority of the design of American axes over the English, caused a wooden model of one of Collins, best to be sent to Birmingham with an order for several thousand to be made for the use of the workmen who had to "blaze the way" through the immense forests of Upper Canada. Unfortunately he neglected to put on eye in his model, and in due time, received an exact duplicate of the same in the shape of a car load or so of highly finished and well tempered axes with *no hole for a handle.*

My informant stated that he had seen a quantity of eyeless axes lying in a warehouse opposite Detroit. C. B.

Nerves Uniting.

MESSRS. EDITORS:—In looking over some back numbers of your valuable paper I find, page 323, Vol. XVIII., that Mr. Eades (a dentist in Ohio who mentions a few intersting cases of teeth being extracted and afterward replaced) makes the following remark: "What is singular about it is that the nerve, after having been broken, should again unite. I do not see how this could be possible."

Permit me to remark that the *vis medicatrix naturæ* acts on nerves and brain matter as well as on muscle, bone, and skin, and that it is a well known fact in surgery that a nerve divided, either intentionally or by accident, will reunite as well as any other structure. The operation of dividing the facial nerve for the cure of neuralgia or tic douloureux has often failed to accomplish the cure intended, for this very reason; and some surgeons have even removed a piece of the nerve of about an inch in length, in order to prevent its reuniting, and the consequent return of the pain. Dr. Willard Parker, of this city, even testifies to a case where the nerve reunited in spite of the removal of a portion of it, and even of that part of the jaw bone through which the channel of the nerve passed. P. H. VANDER WEYDE, M. D.

New York city.

BLASTING WITH NITRO GLYCERIN.---COMPARISON OF THIS SUBSTANCE WITH GUN COTTON AND GUNPOWDER.

From a paper read a short time ago by Edward P. North, C. E., before the American Society of Civil Engineers, of New York city, we make the following extracts on the properties and uses of nitro glycerin. It appears from a statement in another column, that Mr. Nobel, the inventor of the substance, has not been able to control it within safe limits, as his own works were recently blown up:

I have been led to introduce to your notice the subject of this paper (nitro glycerin, or Nobel's blasting oil), because its application to blasting is comparatively new, and, consequently not generally known. As over three-fourths of a tun has been used on the New Canaan Railroad, of which I am now in charge, I may, perhaps, be able to convey some ideas of information and interest. I have, however, to regret that no accurate accounts of the comparative cost of quarrying with powder and nitro glycerin have been kept on this road, and that I can only give impressions as to the cost. It may be as well here to give a little sketch of nitro glycerin, and to compare it with powder and gun cotton.

Gunpowder is composed of a variable quantity of nitrate of potassa, sulphur, and carbon (charcoal), the nitrate of potassa being replaced in cheap powder by nitrate of soda.

Gun-cotton was discovered by Prof. Schonbein, about 1846, and its manufacture was almost immediately commenced, but never with financial success until lately.

Nitro glycerin was discovered in 1846, by Sobrero, but nothing was done with it until 1863, when Alfred Nobel patented its application to blasting. Gun cotton and nitro glycerin are made, the one from cotton and the other from glycerin, treated with nitric and sulphuric acid, the action of the sulphuric acid being, in each case, to intensify the action of the nitric. In the case of gun cotton, cotton which has a formula of C_{12}, H_{10}, O_{10}, is dipped into a mixture of three parts of sulphuric acid and one of nitric acid, by weight. Some of the oxygen in nitric acid goes to the hydrogen, forming water, and the formula stands C_{12}, H_7, 3 (NO_4), O_{10}+6HO, three parts of the hydrogen in the cotton being replaced by three pasts of nitrous acid. On its explosion, it is all resolved into gases, namely:

		By volume.	By weight.
Carbonic oxide	CO	28.95	29.97
" acid	CO^2	20.82	33.86
Light carbureted hydrogen	C^2, H^4	7.24	4.28
Hydrogen	H	3 16	0.24
Nitrogen	N	12 67	13.16
Carbon	C	1.82	1.62
Steam	HO	25.34	16.87
		100.00	100.00

Leaving no residue. According to Von Lenk, in blasting, one pound of gun cotton is equal to 6,274 pounds of powder. According to a commission appointed by the French government, the explosive power of gun cotton depends, in a measure, on the degree of compression, and, in the mean, is about three times that of gunpowder. When uncompressed, it will burn more freely than gunpowder but by compression its rate of burning can be bought below that of gunpowder. Gun cotton, according to Prof. Abel, when well made, can be kept for a long time without undergoing change, and can be transported as safely as powder; but when impure and acid, a gradual decomposition takes place, the result of which is an explosion.

Nitro glycerin is made by treating glycerin, which has the formula C_6, H_5, N_3, O_{18}, with nitric and sulphuric acids, as in the case of cotton, and the chemical reactions are nearly the same, it being in both a case of the substitution of nitrous acid for a part of the hydrogen. By explosion, according to an article in the London *Mechanics' Magazine*, September, 1865, one volume of oil is converted into 429 volumes of carbonic acid, 554 volumes of steam, 39 volumes of oxygen, and 236 volumes of nitrogen—1,298 volumes in all, for one volume of liquid oil, being thus theoretically, five times more effective than its bulk in gunpowder; but by the greater amount of heat generated by the explosion, and the consequent higher tension of the gases, it is really thirteen times more effective by bulk, and eight times by weight, than the same. The United States blasting oil company, in a pamphlet published by them, assert that nitro glycerin has thirteen times the strength of powder by volume, and ten times by weight. It is a lightish, yellow, oily liquid, with a specific gravity of 1.6, nearly insoluble in water, not volatile, taking fire at 360° Fah., and freezing at from 40° to 36° Fah. When impure and acid, it decomposes spontaneously, with an escape of gas and the formation of oxalic, C_4, O_6 2HO, and glyceric, C_6, H_6, O_8, acids. Under these circumstances it is liable to explode.

My attention was first called to the use of nitro glycerin by the fact that our contractor, Lawrence W. Myers, was losing money, on account of the extreme hardness of the rock in one cut, and its wetness in another. As I advised the use of nitro glocerin, I, of course, took a great deal of interest in its success, loading and firing a great many of the holes myself. I will give a sketch of the circumstances and results as they appeared. In one cut, which in its deepest part was about 12 feet, the rock was mostly feldspar and mica, in large crystals; but it was very wet, springs forcing themselves up through the bore holes, so that they could not be puddled. Here the fact that nitro glycerin was entirely unaffected by water rendered it particularly valuable. The mode of procedure was this: A single hole was put down to grade about the center of the cut, a foot or two further back from the face than the depth of the cutting, so as to have the line of least resistance a vertical one; from five to eight pounds of nitro glycerin were poured in. A tin cartridge about four inches long, and three fourths in diameter, filled with powder, into which a waterproof fuse was introduced, was put into the nitro glycerin, and the hole filled with water. These charges were very effective, in some instances loosening over 100 cubic yards, so that it could be readily barred out, while that immediately around the charge was burned to a soft white powder. The quarrymen said it had turned to lime. About 50 per cent. of the rock was usually so fine as to be readily thrown into carts without sledging or block holing, while that furthest from the charge was in masses of two or three cubic yards.

In the other cut, which for about 50 feet was 21 feet deep, and contained about 8,000 cubic yards, the rock was very hard feldspar and quartz, so that sometimes drills were used up faster than one to an inch. In this cut it was found better to have the line of least resistance a horizontal one. There was no grain to this rock, it not splitting or breaking more readily in one direction than another. This cut was worked from both ends, one foreman using small holes, and, of course, more of them, while the other sank his holes in the center, nearly to grade, and tried to throw out the cut at one shot. Though the plan of single holes was not always successful, still, on the side on which it was tried, there was an economy of about 10 per cent. in labor per yard moved, and a slight loss in the quantity of rock per month, which latter item I think due to the fact that too much was put before the single holes, as the rock in the face of the cut was sometimes in masses of 5 or 6 cubic yards, requiring block holing.

The effect of nitro glycerin differs from that of powder in consequence, I suppose, of its greater force and quickness of explosion, in that, that powder, when fired, when the line of least resistance is a vertical one (the bore also being vertical, and the rock homogeneous), will form a tolerably uniform crater, with the sides sloping according to the hardness of the rock. When the line of least resistance is a horizontal one, and not too long, the rock being solid, the blast will throw out what is before it, leaving the back uncracked, and no sign of action below the bottom of the hole.

Nitro glycerin, on the contrary, in the first case, will form a well, and if the rock is not too hard, the bottom diameter will be greater than the top. Nor, as far as I have seen, will the action ever be concentrated on the line of least resistance, but will extend back from the hole and downward to a greater or less distance, according to the hardness of the rock. I think that this action of nitro glycerin, in connection with the fact that its explosive force is uninfluenced by the presence of water, will tend to its being the only explosive agent used in all subaqueous operations; for with any depth of water, it will be unnecessary to drill holes, only to sink a flask of nitro glycerin on the rock and fire it.

In regard to the relative safety of gunpowder, gun cotton, and nitro glycerin, I think the last named is the safest

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agent. I do not wish to be understood to underrate the disasterous effects that would, probably, and have occurred from an accidental explosion; only to say that I think, with properly made, unfrozen nitro glycerin, the cans packed in plaster of Paris, as the law requires, it is safer than powder. I speak of its being unfrozen, because during the use of it on this road, from last September until the middle of January, the only instance in which any glycerine was exploded without the aid of powder, was a small frozen piece that was crushed between two stones. Nitro glycerin was placed in the hands of six different foremen, and by them in the hands of the men; was carried unprotected in sixty pound cans up and down the line, frozen and unfrozen, in dump carts; and was generally treated with the recklessness with which Irishmen treat powder. And as blasting material is usually used on roads, it must be the safest of the three; for, as there is no necessity of any tamping but water tamping, if a charge miss fire, there is no solid tamping to cut out—at the danger of the driller's life—as with powder. For if water has been used, another cartridge can be dropped in in a minute; or if sand has been used, a portion of it can be scraped out, and a small charge of glycerin poured in and fired on top of the old charge. Besides which, gun cotton will ignite and explode not only from a light spark, but from a flame, thus making it the most dangerous of the three; while powder, though it cannot be ignited without the aid of a spark, or something red hot, can be ignited by any spark, such as one flying from drills or from rocks falling; and nitro glycerin cannot be exploded, even if ignited, unless confined, and in that case a spark could hardly reach it.

In regard to the accidents that have occurred: the one in New York almost surely occurred from the nitro glycerin having leaked into the sawdust in which it was packed, and oxidation and combustion followed, as surely as if oil had been put on the same sawdust, and it put in a warm place, only the combustion was rather more rapid. I have been informed that the accident at the express office in San Francisco occurred from the same cause. As there is now a law against transporting nitro glycerin in glass, or in any mode except in tin cans, packed with plaster of Paris in wooden boxes, we will probably have no more such accidents.

At Aspinwall, a case of nitro glycerin was dropped into the hold of the steamship; few of us would have cared to have been on the deck when a barrel of gunpowder was treated in the same way. At Bergen, red hot iron was brought in contact with tin and solder that melts at from 360° to 475° F., and nitro glycerin would be of little use as a blasting material if it had not proved disastrous. At the risk of reiteration, I will sum up the advantages possessed by nitro glycerin over gunpowder and gun cotton.

1st, That, being of greater strength, there is a great saving in drillers' wages, as fewer holes have to be made, and the charge of glycerin can be put into the rock much more compactly. For instance, if, to break up a certain rock, 1 foot of depth in the bore hole was required with glycerin, 13 feet would be required with powder, which would necessitate 6 feet of additional drilling if but 1 hole was used; but 13 feet of powder could not be exploded in a 2 inch or 2¼ inch hole so that it would be effective, on account of the slowness with which it burns, so that additional holes would have to be drilled, with in each an allowance of at least ⅔ of the depth for tamping. With gun cotton there would not be so much difference.

2d, That nitro glycerin is not injured, either permanently or temporarily, by water or moisture, which enables us to use water tamping, a great saving of time and risk of life, impossible with either of the others; and it can be stored in damp cellars, or under water, without the necessity of drying it before using, as in the case of gun cotton, or having it ruined, as with gunpowder.

And lastly, the difficulty of exploding it renders it the least dangerous to human life.

EFFECT OF ARSENIC UPON APPLES.

Some years since a man was indicted by the Grand Jury of a western county for an attempt to kill by poisoning with arsenic. He was convicted, and sentenced to be imprisoned, at hard labor, in the State Prison at Auburn, for the term of twenty years, and was subsequently pardoned, his innocence having been satisfactorily established.

It was charged in this case that the arsenic was administered by inserting it into cuts made in the sides of apples, four in number. It was proved that the cuts were made on the 22d of September, and that the apples were laid away in a drawer until the 11th of October in the same year, during which time the accused was absent, and, of course, had no access to the fruit. Nothing remarkable was discovered in the taste of the fruit or its appearance. Two of the apples examined by a professional Toxicologist, had slits in their sides which contained crystals of white arsenic amounting to at least one grain on the cut surface of a single apple. The eating of the fruit was followed by all the symptoms of arsenical poisoning, but, fortunately, by timely measures, death was prevented.

Some doubts having arisen upon the sufficiency of the evidence, investigations were commenced to ascertain the effect of arsenic upon apples and other pulpy fruits. The results of these investigations were as follows:

First, when apples have smooth slits made in them with a sharp instrument, the changes which take place in them are very slight, during an interval of two or three weeks, especially so if they are (as was proved in the case cited) in good keeping condition when the slits are made; Secondly, when arsenic—in the form of arsenious acid—is inserted into the slits, the cuts begin to open in the course of from two to five days; the edges are separated from one eighth to one fourth of an inch, or even more, showing very plainly the white arsenic within. At the same time the skin adjacent to the cut begins to be discolored, and, together with the pulp beneath, turns dark brown, both in appearance and consistency resembling the ordinary slow decay of the apple. This change begins to show itself on the second or third day, and then makes steady and regular progress, extending itself on each side of the cut so rapidly that by the eighth day it attains a width of from five eighths to seven eighths of an inch; by the sixteenth day, one and a half to two inches, and by the twenty-first day, one half or more of the apple will be affected with decay.

The experiments were conducted with great care, upon a great number and variety of apples, and the results were singularly uniform. Experiments upon apples baked with arsenic placed in a slit upon their sides, show that the arsenic, in such cases, is discolored. In the case cited it was proved that one of the apples which was baked had *white* arsenic in it. It therefore must have been inserted after it was baked.

In this case, it will be remembered that the apples were placed in a drawer on the 22d of September, remaining there nineteen days, and as the accused was absent during the whole of that time, the charge could only be sustained upon the theory that he had inserted the arsenic on the 22d of September. If that had been the case the apples would have been unfit to eat upon the 11th day of October, the time when the apples were eaten.

This action of arsenic upon the pulp of fruits contrasts singularly with its action upon animal tissues, which, it is well known, are preserved by its action.

Iodine and Carbolic Acid.

A communication to the *American Journal of Pharmacy* contains a description of a new solution containing iodine, carbolic acid, and glycerin, which is claimed to possess superior therapeutic virtues. The solution is thus prepared: Take of the compound tincture of iodine, forty-five minims; crystallized carbolic acid, fused, six minims; glycerin, eight drachms; distilled water, five ounces.

The iodine color gradually disappears, and the solution eventually becomes colorless. The time necessary to complete this change depends on the temperature—at 60° Fah., eight to ten days are required; if the cork of the bottle is secured, and the mixture exposed in a water bath to a temperature of from 90° to 100° Fah., the change will be effected in eight or ten hours. The change takes place as quickly in diffused light as in direct sunshine, provided the temperatures are equal. The solution, exposed to sunshine, becomes somewhat turbid, and deposits a muddy precipitate.

The change is due entirely to the carbolic acid, glycerin alone, under similar conditions, effecting no change in the iodine solution, while carbolic acid acts equally well with or without the presence of glycerin.

The character of the change is probably the transformation of the iodine into iodide of formyle (iodoform) at the expense of the carbon atoms of the carbolic acid.

The solution possesses antiseptic and stimulant properties in a marked degree, and has met with favor as an application in the form of injections, gargles, and lotions "in cases of sore throat, ozœna, abcesses in the ear, and foul or indolent ulcers."

It has also been recommended as an injection in cases of internal hemorrhoides, and by inhalation for throat and bronchial affections. When used for inhalation the glycerin can be omited.

DESTRUCTIVE FIRE FROM FIREWORKS.—The Lawrence Academy, at Groton, Mass., was entirely consumed by fire on the afternoon of the 4th inst. The library, apparatus, etc., were mostly saved. The fire was supposed to have caught from Chinese crackers thrown upon the piazza by a boy. The loss on the building is estimated at $4,000, entirely covered by insurance. A rocket also exploded in the steeple of St. John's Episcopal Church, in Buffalo, on the 4th. The structure was soon afterward wrapped in flames, which destroyed it with all its valuable contents. We trust the severe lessons which are thus annually received will result in the gradual substitution of more sensible methods of celebrating the birthday of American Independence. In marked contrast to the above we notice that on the 4th of July Mr George W. Childs, of the *Philadelphia Ledger*, gave a "Continental Hotel" dinner to about 150 newsboys in the press room of the *Ledger* building.

IT is said that letter envelopes were made about forty years ago, by Brewer, a bookseller in Brighton, England. He employed a pattern made of metal plates for cutting out the sizes, and the demand for the envelopes became so great that he was obliged to employ a London firm to manufacture them.

NEW PUBLICATIONS.

COLLEGE COURANT. Yale.

We are in receipt of the *College Courant*, published weekly at New Haven, Conn. It appears in a new elegant dress and enlarged form, and its prospectus and able list of contributors give sufficient promise of a brilliant future. It has our best wishes.

THE WORKSHOP, No. 5, published by E. Steiger, No. 17 North William street, contains an article upon bookbinding and fancy leather goods, also several ornamental designs for various purposes.

THE ZOETROPE, OR WHEEL OF LIFE.—We have already noticed this unique optical instrument, which has afforded so much amusement to old and young, and although an American invention, its sale has already become quite extensive in Europe. Sets of figures are furnished with each wheel, and the changes which its rotation effects are both amusing and instructive. The Zoetrope is manufactured by Milton Bradley & Co., Springfield, Mass.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

GREASING WAGONS.—But few people are aware that they do wagons and carriages more injury by greasing too plentifully than in any other way. A well made-wheel will endure common wear from ten to twenty-five years, if care is taken to use the right kind and proper amount of grease; but if this matter is not attended to, they will be used up in five or six years. Lard should never be used on a wagon, for it will penetrate the hub and work its way out around the tenons of the spokes, and spoil the wheel. Tallow is the best lubricator for wood axle-trees, and castor oil for iron. Just grease enough should be applied to the spindle of a wagon to give it a light coating this is better than more, for the surplus put on will work out at the ends, and be forced by the shoulder-bands and nut-washers into the hub around the outside of the boxes. To oil an iron axle-tree, first wipe the spindle clean with a wet cloth with spirits of turpentine, and then apply a few drops of caster oil near the shoulder and end. One teaspoonful is sufficient for the whole.

TO REMOVE THE TASTE OF NEW WOOD.—A new keg, churn, bucket, or other wooden vessel, will generally communicate a disagreeable taste to anything that is put into it. To prevent this inconvenience, first scald the vessel well with boiling water, letting the water remain in it until cold; then dissolve some pearlash or soda in lukewarm water, adding a lime to it, and wash the inside of the vessel well with this solution. Afterward scald it well with plain hot water, and rinse it with cold water before you use it. The reason for this is the ready combination of resinous matters with alkalines to form compounds soluable in water. The resinous substances of wood, while new, cause a disagreeable taste and odor in substances kept in wooden vessels.

RAILROAD ENTERPRISE.—It is less than half a century since the first railroad in the United States was commenced—the Baltimore and Ohio, in 1828—and now there are forty thousand miles of railway within the limits of the country. The Mohawk and Hudson Railroad, in New York, was the second road built, and the South Carolina Railroad was the third. The road from Boston to Albany was commenced in 1841, and a continuous line of railway between Boston and New York was formed in 1849, by the completion of the New York and New Haven road. The Erie and the Hudson River lines were completed in 1851, the Michigan Southern and Michigan Central the following year, and in 1853 an unbroken line of one thousand miles of railroad between Boston and New York and Chicago was formed. Between 1849 and 1857, there were 15,813 miles of road constructed, and the railroad enterprise gained such an impetus from the success of those eight years that no obstacle has since been able to offer anything more than a temporary check. At the close of the year 1837 there were 1,093 miles of railroad in the United States, and at the close of 1867, there 33,244 miles. This gives an average increase of 1,156 miles per year for thirty-three years. The largest number of miles opened in one year was 3,643, in 1856, and the least number was 159, in 1843.

GOLD IN ALASKA.—Reports continue to reach us which tend to confirm the previous statements of important gold discoveries in Alaska. Much excitement is said to prevail in Oregon, Washington Territory, and British Columbia, in consequence of these reports. Specimens of anthracite have been brought to Sitka by the Indians, who report large deposits in the interior. These statements are probably exaggerated, but there is some reason to believe Alaska contains considerable mineral wealth. It ought to contain some mineral wealth as it will take considerable to purchase this territory.

PROTECTION OF EYES.—In a recent investigation by an oculist of Breslau, embracing six manufacturing establishments, employing in the aggregate 1,283 workmen in the different departments of boilermaking, blacksmithing, turning, fitting, &c., it was found that 90 per cent. had often been injured in the eye by minute pieces of metal, and that 40 per cent. had been under medical treatment for serious accidents to their eyes. The whole time lost by the workmen from this cause amounted to 4,726 working days. Ordinary glass spectacles were objected to on account of their liability to be broken, Mica spectacles were tried, and found to fulfill all requirements. The mica used is of the purest kind, very thin, and is curved somewhat like a watch-glass. It is held in a frame which fits closely enough to the eye to prevent the passage of metallic fragments. Mica imparts a pale gray tint to objects, but does not impair the eye. The price of a pair of these spectacles, at Breslen is about 15 cents. If, from want of proper protection, a fragment of metal, wood, or other substance, should get in the eye, it can often be easily removed as follows: Take a horse hair and double it, leaving a loop. If the mote can be seen lay the loop over it, close the eye, and the mote will come out as the hair is withdrawn. If the irritating object can not be seen raise the lid of the eye as high as possible and place the loop as far in as you can, close the eye and roll the ball around a few times, draw out the hair; the substance which caused so much pain will be sure to come with it.

THE ground has been broken on the Pacific and Atlantic railroad at Springfield, Mo. A large number of men are employed, and the work will be pushed with a view of connecting St. Louis and San Francisco by the 35th parallel.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

MAKING CORES FOR CASTINGS.—Benjamin S. Benson, Baltimore, Md.—This invention consists in an improved device for holding and cleaning the metallic cores used in casting oven pipes, by which such cores can be evenly and thoroughly scraped and cleaned.

VENTILATOR.—J. W. Foard, San Francisco, Cal.—The object of this invention is to furnish an improved ventilator for ships, buildings, cars, etc., which while affording a thorough ventilation to the ship or building upon which it is used, entirely prevents the rain from entering through the ventilator.

FIREMAN'S EXTENSION LADDER.—Robert H. Jones, San Francisco, Cal.—This invention is an apparatus by which, in cases of fires in lofty buildings, the hose can be carried to the top of the building, and there operated conveniently and safely from the ladder. A device is connected by which persons and valuable property can, at the same time, be removed from the upper stories of the building.

HOP POLE.—Luman B. Clark, Bambridge, N. Y.—This invention consists in providing a tapered post of scantling which may be driven into the ground, and which may form a base to which the poles may be attached or rendered detacnable.

MILL STONE.—Peter Zimmerman, Delaware Water Gap, Pa.—This invention consists in the arrangement of a bail or suspending apparatus for the stone so as to possess the quality of a universal joint, whereby, although the faces of the stones may not be perpendicular with the spindle, the jarring and pounding action of the parts usually occurring when rigidly connected together will be avoided.

STOVE OR HEATER.—F. S. Zumstein, Evansville, Ind.—This invention has for its object to furnish an improved stove for railroad cars, steamboats, hotels, houses, etc., which shall be simple in construction, will keep the fire in full operation from six to twenty-four hour without its being necessary to attend to the fire, and which may be used with perfect safety on railroad cars, as the stove is so constructed as not to be liable to be broken and to scatter the fire should an accident happen to the car.

PRUNING AND HARVESTING HOOK.—John Stark, Thomasville, Ga.—This invention relates to an improvement in hooks for harvesting and cutting up corn and also for pruning trees, and it consists in making the hook or cutting edges in two or more parts united together.

SELF-DETACHING PULLEY.—Jesse E. Gustin, Elmira, N. Y.—This invention relates to an improvement in pulleys used for raising heavy weights whereby the same are made self-acting or so arranged that the position of the pulley can be changed and the load dumped automatically.

STEAM PRESSURE ALARM.—David McFarland, New York City.—Two patents have been granted on this invention which relates to a new and simple device to be connected with a steam boiler for sounding an alarm when the steam within the boiler exceeds a certain pressure, and also for sounding an alarm when the water descends to a certain level.

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PAPER MACHINE.—Isaac Jennings, Fairfield, Conn.—This invention has for its object to so improve the construction of ordinary paper machines that the paper may be removed from the rollers in the form of tubes either straight or tapering for the formation of the bodies of buckets, barrels, etc, or to form pipes or tubing.

HAY FORK.—E. J. Fenn, Medina, Ohio.—This invention has for its object to furnish a simple, convenient and effective fork for handling hay with horse or other power, and which shall at the same time be easily operated to load and unload it.

HORSE POWER HAY FORK.—William Hannah, Middlefield Center, N. Y.—This invention relates to a new and improved method of constructing hay forks for the unloading of hay by the power of a horse, whereby the same is more rapidly and economically done

STOVE.—S. W. Gibbs, Albany, N. Y.—The object of this invention is to produce a self-feeding, base burning stove for heating purposes of such formation as will allow a free escape for the gasses generated, and which shall allow a free supply of fresh air to the fuel at the base of the feeder,

REFRIGERATOR.—Anthony B. Sweetland Fitchburg, Mass.—This invention relates to an improved refrigerator for household or other use and it consists in the method in which the ice is supported therein and the provision made for properly distributing the ice water.

MILK CAN,—David W. Shaw, Baltimore, Md.—This invention relates to a method of constructing cans for transporting and keeping milk and other articles and it consists in forming the neck of the can so that the milk may be secured air-tight and the cover locked in its position, thus protecting the milk from the action of the atmosphere as well as from being stolen, and preventing the churning ot the milk during transportation.

HORSE HAY FORK.—E. I. White, Locke, N. Y.—This invention has for its object to furnish a neat, simple, convenient, and effective hay fork, and which shall at the same time be strong, not liable to get out of order, and easily operated.

HOP VINE SUPPORT.—Peter J. Fuller, Clarksville, N. Y.—This invention relates to an apparatus for training hops, and consists of a short pole secured in the ground, and of a series of arms pivoted to the upper part of the same The arms can be brought to an upright position, and are then clamped by means of hooks or other equivalent devices, so as to form rigid supports for the growing hops. Four, more or less, such arms being arranged on each pole. An equal number of vines can be framed on each pole. The arms are, by means of the aforesaid hooks, so firmly held that they need no further fastening or support. When the hops are to be removed, the arms are swung down, and the vines can then very easily be stripped off.

MEAT CHOPPING MACHINE.—Henry Obrecht, Mahoney City, Pa —This invention relates to a new machine for chopping meat or other articles, and consists in imparting to the cutter or cutters, beside an up and down reciprocating, a slow rotary motion. The cutters are fastened to the lower end of a vertical shaft, which is swiveled in, and suspended from an up and down reciprocating block or other device, said shaft also passing through the center of the wheel, to which slow rotary motion is imparted, the shaft or wheel having a feather so that the shaft is turned by the wheel, and may still move up and down through the same.

WOODEN PAVEMENT.—Duncan McKenzie, Brooklyn, N. Y.—This invention relates to a new and useful improvement in wooden pavements of that class which are constructed of blocks laid with the grain in a vertical position and placed in parallel rows with a space or recess allowed between the rows, to receive sand and to serve as a foothold for horses. The invention consists in connecting the rows of wooden blocks by means of dovetail wooden strips attached to the sides of the blocks and arranged in such a manner that when the pavement is laid it will be retained in proper position or at the proper level, the several blocks sustaining each other throughout the entire length of the pavement.

COUPLING RAILROAD CARS.—James M. Everhart, Pittston, Pa.—This invention relates to a new and useful improvement in coupling railroad cars, and has for its object the avoidance of all slackness or play between the coupled cars and the consequent jamming, jerking, etc., attending the said slackness or play.

APPARATUS FOR DRAWING WATER.—W. P. Walling, Swartz Creek, Mich.—This invention relates to a new and improved apparatus for drawing and conveying water from a spring or brook to any convenient distance, and is designed to avoid the labor of carrying water by hand from brooks or springs which are at some distance from a house or any place where the water is to be used.

GRAIN SEPARATOR FOR THRASHING MACHINES.—Daniel S. Yeakle, Dillingersville, Pa.—This invention relates to a new and improved separator for separating the grain from straw as said substance is discharged from the thrashing cylinder of a thrashing machine, whereby the work above mentioned is performed in a perfect manner.

LOCKING NUTS.—Samuel Garber, Beaver, Pa.—This invention has for its object to furnish a simple and effective means for keeping nuts upon bolts that are subject to a frequent or continuous jarring, designed especially for securing the nuts upon the bolts that hold the fish plates to the sides of the rails of railroad tracks, but which are equally applicable to nuts upon bolts in other situations.

PIPE TONGS.—James M. Evarts, New Haven, Conn.—This invention consists in providing a long slot in one of the jaws when the joint is to be formed with the other jaw, for sliding the pivot, which is fixed to the other jaw, back and forth, which slot, for about half the distance through the jaw, is perpendicular to the face of the jaw, and for the other half inclined thereto in such direction as to present a section of a V form, or the section of a triangle of which the base is the longest side. The focus of these said inclined walls of the slot are serrated and a stud fitted to the axial pin and provided with corresponding angular serrated sides, and also with a rectangular portion to fit into the rectangular portion of the slot is interposed in the said slot between the jaws and constitutes the means of securing the jaws at any position with reference to each other within the angle allowed by the said slot.

HOG TROUGH.—Caroline M. Rolfe, Laconia, N. H.—This invention relates to a new and improved hog trough of that class which are provided with pivoted covers so hung and arranged that by adjusting the latter in one position the trough will be exposed at the outer side of the pen or sty and rendered accessible for the pouring of food into the trough, while the latter is shut off from or rendered inaccessible to the hogs in the sty, and when the cover is adjusted in the other position the trough is rendered accessible to the hogs. The invention consists in a peculiar construction and arrangement of the cover, whereby a very economical and durable trough of the kind specified is obtained.

VELOCIPEDE.—George, William, Alfred, Edward, and Frederick Hanlon, New York city.—The object of this invention is to so construct a two-wheeled velocipede that it can be used by various sized persons, and that it may be balanced by the addition of a third wheel, for persons learning to use it.

STEEL SHANKS FOR BOOTS AND SHOES.—Henry Briner and Emil Briner, Manhattanville, N. Y.—This invention relates to an improvement in the strips of spring steel or other spring metal called "steel shanks," for stiffening the bottoms of boots and shoes under the hollow of the foot, or for supporting and keeping in place that portion of the leather bottoms of boots and shoes.

WINDOW MUSKETO BAR.—C. T. Warren, Linden, N. J. Patented June 30 1868.—This invention relates to the manner in which musketo bar, gauze, or netting is operated, so as to prevent the entrance of those pests into a room through the windows, and it consists in operating the bar (either rolling up or unrolling it) by the act of raising or lowering the sashes, by means of fixed cords and rollers.

LADDER AND SCAFFOLD FOR PAINTING AND OTHER PURPOSES.—Robert Rowan, Parnassus, Pa. Patented June 30, 1868.—This invention relates to an apparatus for facilitating the operation of painting buildings, and which is adapted to other uses where work is to be performed on buildings in elevated situations.

DEVICE FOR REPAIRING BARRELS.—E, W. Gillman, Hunter's Point, N. Y. Patented June 30, 1868.—This invention consists in binding the barrel with adjustable metallic bands and thereby holding such barrel or vessel together, when the hoops are removed therefrom, so tightly that leakage is prevented, and so that the broken or decayed stave or staves may be removed and other sound staves be inserted in place thereof.

MATCH SAFE.—Alfred Hoyt, New York city. Patented June 30, 1868.—The object of this invention is to so form a receptacle or box for keeping matches, and conveniences for lighting the same, that the matches shall be kept dry and not exposed to moisture from the atmosphere, and so that facilities shall always be at hand for lighting the match.

LETTER BOX.—D. P. Jordan, Chicago, Ill. Patented June 30, 1868.—This invention relates to an improvement in the method of receiving a securing letters, papers, etc., and it consists in a novel combination of a letter and newspaper box.

INK.—D. C. McNeil, Osceola, Mo. Patented June 30, 1868.—This invention relates to a new and improved ink, whereby the ink when used on paper is invisible, no writing or marks appearing until the paper is exposed to the fire.

BUTTONHOLE SEWING MACHINE.—Henry E. Reynolds, Bristol, R. I. Patented June 30, 1868.—The object of this invention is to furnish a machine by which buttonholes in clothing may be worked and completed with the same facility with which any other kind of sewing is done on the same garments.

GRAIN DRYER.—Wm. Standing, Cairo, Ill.—The object of this invention is to accomplish the drying of grain in an expeditious and effective manner, and is designed for use in steam grist mills where the waste steam from the engines may be utilized in drying the grain, but is equally applicable in other situations where steam can be obtained.

It consists in general terms of a steam chamber containing grain cylinders through which the grain is passed, and around which cylinders is a steam space.

It is provided with valves for adjusting the rapidity of the passage of the grain through the said cylinders, and perforated wire cloth tubes located within the grain cylinders through which an upward current of air passes to assist in drying the grain, and to bear away the moisture expelled from the same.

It is further provided with a receiving chamber at the base of the apparatus which is formed with lateral openings to admit the air to the lower ends of the said perforated tubes, together with other devices perfecting the whole.

BRICK AND MORTAR ELEVATOR.—Herman Spiro, Knoxville, Tenn.—The object of this invention is to accomplish the raising of brick and mortar for building purposes, and to present the same in a position conveniently accessible to the builders upon the scaffolding.

HOPPER SHOE FOR GRIST MILLS.—W. P. Wyche and Young P. Dickson, Brookville, N. C.—This invention relates to an attachment for grinding mills, and is designed to sift or separate the trash and other foreign matter from grain before it enters the hopper. It consists of a vibrating seive hung above an inclined apron, and both actuated by some suitable mechanism forming part of the mill machinery.

CATHARTIC LOZENGE.—William M. Du Bois, Poughkeepsie, N. Y.—This invention consists in the preparation of a medicinal bark, having cathartic properties, in the convenient and palatable form of a lozenge, pill, or bolus, by which it is more easily and conveniently carried and administered.

COAL SCUTTLE.—Thomas Scantlin and James M. Scantlin, Evansville, Ind.—This invention consists in forming the bottom of a coal scuttle of cast iron, formed with diagonal ridges, which form a central leg at their intersection, and also serve to strengthen the bottom. The manner of uniting the sheet metal sides to the cast bottom is also improved.

PANEL FENCE.—C. W. Spraoll, Rome, Ga.—This invention consists, essentially, in the method of attaching fence panels, which is accomplished in a very simple and effective manner.

WEATHER STRIP.—Benjamin F. Averill, Dunkirk, N. Y.—This invention relates to weather strips for shutting out the drafts of cold air under the bottoms of doors. It consists of a moveable plate, provided with certain mechanism, by which the plate is made to shut downward and close the crack between the door and the sill, and to rise again when the door is swung open.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

J. A. P., of Wis.—Your explanation of the swing is too complex and is partially erroneous; the whole question can be disposed of in a few lines, by considering the shifting of the center of gravity by the person in the swing.

J. A. H., of Ark.—Paper boxes may be made waterproof in a very easy manner by applying a thick coat of turpentine, benzine, or alcohol varnish.

A. T. Y., of Pa.—A novel substitute for plastering is a paste of the fiber of prairie grass or pambo, it is similar to paper pulp, but much cheaper; it may be mixed with some adhesive substance soluble in water. When required to be fireproof mix it with waterglass.

J. H. B., of Ohio.—It is very doubtful if our courts of law would sustain a patent granted under such circumstances. A good deal of consideration is due to the claim of an original inventor, but there is no good excuse for so many years' delay in asserting his rights to a patent.

F. N., of Ohio.—The loss of temper in a scythe from exposure to the rays of the sun in this latitude would we think be scarcely appreciable. We know of no manual that treats of brickmaking. It is an art that must be learned by practice.

S. W. B., of S. C.—Siphons may be used for transferring water over any hight less than 34 feet theoretically, practically about 32 feet may be relied upon. No doubt they might be substituted for the floodgates and trunks of which you speak, but we doubt whether it would be profitable to do so.

J. E. V., of Ohio.—We prefer a solution of gum tragacanth in water, with a little alcohol to prevent souring, to any other ready made mucilage. It is not, however, a fluid, but a paste.

J., of La, asks, "can ice be produced in a vacuum, or in other words, will water freeze if the air is taken from it?" No; the presence or absence of air does not produce congelation. Rapid evaporation of moisture tends to refrigeration, but the total absence of air does not necessarily produce congelation.

O. T. P., of Tenn., says, "I am running an engine the boiler of which is fed with water from the coal bank, the water evidently containing iron and sulphur in solution, which seems to have a bad effect on my boiler. What can I do to neutralize this effect?" No neutralization of the iron is required; it is perfectly harmless. As for the sulphur, perhaps nothing is better than common washing soda to neutralize its effects. But the use of this alkali is troublesome and expensive. The best remedy in this case would be to procure feed water from a purer source.

Z. Mc M., of Mo., asks the best method of dressing deer skins, as he is unable to obtain a skin that has not been damaged in dressing. The "burning" of leather is not uncommon from the use of strong lime as an alkali. In dressing deerskins and the tender pelts of our smaller game and domestic animals some milder alkali, as washing soda or pearlash is preferable to lime, to be followed by an application of a solution of alum.

C. H., of Pa, tells of a practical sawyer ripping up some blocks of wood with a circular saw, and finding that a high speed of the saw prevented its cutting. He wonders at it, and asks the wherefore. Probably the cause is the clogging of the teeth, the dust not having time to deliver, if, as stated the speed was 6,000 or 7,000 revolutions per minute. In this case as in many others "more haste less speed."

E. A., of Conn.—Bodies float in fluids when their weight is equal to the sustaining fluids bulk for bulk. When their weight is less than the fluids in which they are placed bulk for bulk they will rise to and project from the surface. Therefore if a hollow ball containing air floats upon and projects from the surface of any fluid, it will when the air is removed from its interior, float still higher as the weight is diminished, by weight of the air removed. A hollow bar of iron will not sustain as much weight in any way as a solid bar of the same diameter. A hollow bar will however sustain within certain limits more weight, when its ends are supported, and it sustairs more pressure in a horizontal position, than a solid one of the same weight owing to a better distribution of the fibers to meet the strain Another reason is that the central portions of iron bars are not so strong in proportion to their weight as the surface parts. The pressure up on the inside of a balloon from the contained gas is equal to the resistance offered by the containing silk and network, and the pressure of the external air.

G. M., of Ill., thinks he has a theory original with him inregard to the cause of steam boiler explosions, namely, electricity in the boiler. Assuming electricity to be a cause of boiler explosions he proposes the insertion of pointed copper conductors, of wire, around the safety valve to conduct this dangerous fluid from the interior of the boiler to the external atmosphere. We have published enough about this theory until we have facts which are really valuable.

J. B., of Mass.—Iron, steel, and other metals, polished, may be preserved from rusting while unused by a coating of paraffine, or of lard or tallow (not salted) mixed with powdered resin in the proportions of eight of lard and two of resin, applied while hot.

Business and Personal.

The charge for insertion under this head is one dollar a line.

Marshall's line engraved portrait of Gen. Grant. This portrait is commended in the highest terms by Mrs. Grant, Hon. Schuyler Colfax, Gen. Sickles, the artists, Huntington, Durand, and Elliott, and many others. It is the only authentic and satisfactory portrait of our next President that has been issued. Agents for its sale are wanted everywhere. Address Ticknor & Fields, Publishers, Boston, and 63 Bleecker st., New York.

S. S., Wis.—M. M. Leahy, Milwaukee, is agent for Broughton's lubricators, oil cups, gage cocks, and oilers. Undoubtedly they are the best.

Millstone-dressing diamond machine, simple, effective, and durable. Also, Glazier's diamonds, diamond drills, tools for mining, and other purposes. Send stamp for circular. J. Dickinson, 64 Nassau st., N. Y.

Peck's patent drop press. For circulars, address the sole manufacturers, Milo Peck & Co., New Haven, Conn.

Universal filter well.—Drives and works successfully everywhere. Patented in Dec., 1867, by Oscar C. Fox, Georgetown, D. C.

The patent sweet fern and chemical lacing, as made by J. H. & N. A. Williams, Utica, N. Y., is far superior to the ordinary kinds of belt lacings made under the same patent.

Artificial stone—cheap and new invention—for sale. T. Hodgson, 7 Beach Place, Brooklyn, N. Y.

Patented articles a specialty.—All description of sheet and cast metal small wares made to order and introduced to the trade Dies and tools for sheet metal, castings, etc., etc. J. H. White, Newark, N. J.

Olmstead's oilers are the best. Sold everywhere.

Want to buy—State right for brick machine. Address box 125, Toledo, Ohio.

Portable India-rubber bathing tub.—Can be carried in trunk. Also, formula for electro chemical bath for all diseases. United States for sale. Price $2000. Address box 100, Clarksburg, West Va.

All buyers of tools and hardware should have Wilkinson & Co.'s illustrated catalogue. The illustrations are very full. Sent on the receipt of 50c. 2 Washington st., Boston.

Brick Machine.—Lafler's New Iron Clad has more advantages than any other ever invented. For descriptive circular address J. A. Lafler & Co., Albion, Orleans county, N. Y.

For services of experienced detectives to obtain evidence against infringers of patents, address Box 581, Newark, N. J.

Adams' improved air cylinder graining machine, in operation daily and specimens of work at 41 Murray st. Send stamp for circular full particulars, prices, etc. Address Heath, Smith & Co., as above.

Prang's American chromos for sale at all respectable art stores. Catalogues mailed free by L. Prang & Co., Boston.

For breech-loading shot guns, address C. Parker, Meriden, Ct.

Livingston & Co., Iron Founders, Pittsburgh, Pa., make to order fine, smooth castings, of all kinds, from A No. 1, soft and strong iron. Give them a trial.

EXTENSION NOTICES.

Ann Winter, of Rondout, N. Y., administratrix, and William Winter, of said Rondout, administrator of the estate of Archibald Winter, deceased, having petitioned for the extension of a patent granted to the said Archibald Winter the 19th day of September, 1854, for an improvement in machines for sawing fire wood, etc., for seven years from the expiration of said patent, which takes place on the 19th day of September, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 14th day of September next.

Jules Debauvais, of New York city, executor of the estate of Victor Beaumont, deceased, having petitioned for the extension of a a patent granted to the said Victor Beaumont the 3d day of October, 1854, for an improvement in steam gages, for seven years from the expiration of said patent, which takes place on the 3d day of October, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 14th day of September next.

Gardner S. Blodgett and Paul T. Sweet, of Burlington, Vt., having petitioned for the extension of a patent granted to them the 5th day of December, 1854, for an improvement in ovens for baking, for seven years from the expiration of said patent, which takes place on the 5th day of December, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 16th day of November next.

Rebecca A. Marcher, of New York city, executrix of Robert I. Marcher deceased, having petitioned for the extension of a patent granted to the said Robert I. Marcher the 22d day of May, 1855, for an improvement in tools for grooving moldings, for seven years from the expiration of said patent, which takes place on the 22d day of May, 1869, it is ordered that the said petition be heard at the Patent Office on Monday, the 21st day of December next.

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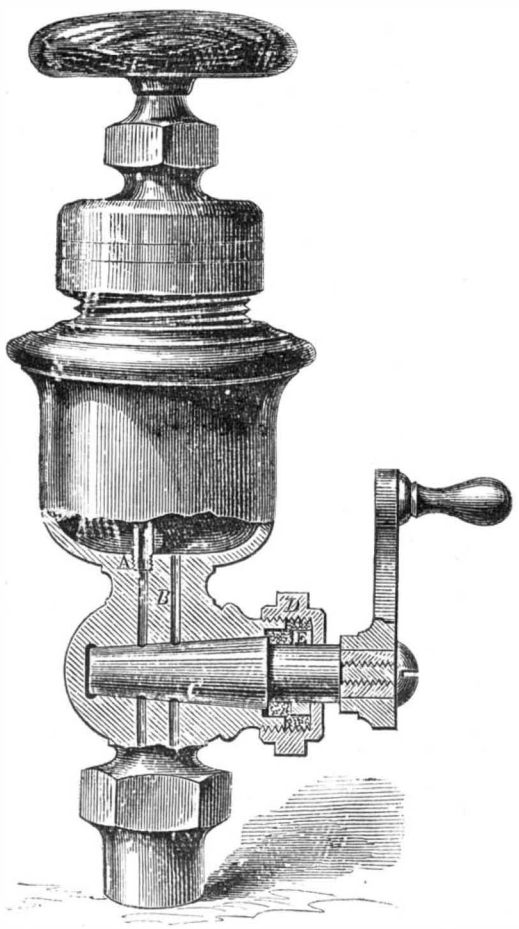
HARLIN'S PLAN FOR IMPROVING OIL CUPS.

The great difficulty with the oilers generally in use on the cheats of engine cylinders is the wear of the plug and the trouble of grinding and resetting it. It is in use but a little while before it leaks and becomes a source of continual annoyance. After being several times re-ground the transverse holes through it become out of line with those in the cup and stem, which should correspond. The object of this improvement—for which a patent is now pending through the Scientific American Patent Agency—is to provide a means of making these leaky or discarded oil cups useful and even better than before. It consists simply in packing the plug so that no leakage is possible and that the portion which is seated in the stem is not compelled to perform two offices.



A brief reference to the parts of the engraving will readily explain the action of the oiler. A is the pipe for the admission of the steam to the surface of the oil in the cup, and B, the oil hole leading from the cup to the interior of the chest. C is the plug and D the stuffing box, inside of which is the packing and the ring, E. From these references any engineer or machinist will see how readily one of the common oilers may be improved to render them perfectly effective, durable, and convenient.

Further information may be obtained by addressing McNab & Harlin, 86 John Street, New York city.

GILDING ON WOOD.

A correspondent inquires why picture and mirror frames which are gilded receive a coat of some white composition before being gilded, while the letters and ornamentations on signs, made also of wood, do not.

It will be noticed that picture frames when gilded have a luster — are burnished — while the letters on signs are "dead." The composition referred to is necessary to this burnishing, as the wood would "give" too much and the leaf be broken and destroyed. To prepare the frame for the gold leaf a mixture of hot size and whiting, quite thin, is applied evenly, and followed by successive coats, each thicker than the other, care being taken that the ornaments or carvings are not clogged and filled by the mixture. The coating when completed is about one-sixteenth of an inch thick, and is smoothed with pumice stone. Upon this bed is laid a composition of clay, red chalk, plumbago, suet, and bullock's blood. The leaf is then applied precisely as in ordinary gilding, which will be presently described, and burnished with agate or bloodstone set in convenient handles.

In ordinary gilding, as for the lettering on signs, no preparation is necessary, except to apply a mixture of boiled linseed oil and ochre, called gold size, which should stand over night or for a few hours until, to the practiced touch, it is of the proper viscidity to receive the leaf. The application of the leaf appears to be perfectly simple, but it requires much experience, dexterity, and the exercise of discretion and good judgment. The gold leaf comes in "books," each leaf of which is coated with red chalk, an argillaceous oxide of iron, to prevent the adhesion of the gold to the paper. The gilder, holding in his left hand a cushion covered with soft leather and in his right the foot of a rabbit or hare, removes one of the gold leaves from the book by simply touching it with the hare's foot or lifting it with a thin steel blade, and conveys it to the cushion, on which he spreads it by gently blowing upon it, by which he smoothes out all the wrinkles. With his blunt edged knife, similar to a painter's palette knife, he cuts the leaf into pieces adapted in size to the spot to be guilded, and with the hare's foot lifts the piece and dexterously conveys it to its place, finishing the process by touching the uneven portions with a soft camel's hair pencil. No draft of air can be allowed in the room where this work is done, as the particles of gold leaf are so light that they fly at the slightest breath. Sometimes it is necessary to press portions of the leaf into depressions of the work, if for instance it is a carved frame, by a wad of soft cotton, but this cannot be used in a damp atmosphere.

THE NICOLSON PAVEMENT--IMPORTANT PATENT EXTENSION.

The Commissioner of Patents has extended the patent granted to Samuel Nicolson, August 1854, as reissued Aug. 1867, for a wood pavement. This pavement is intended to combine the good points of all other pavements.

A sufficient foundation is first placed under blocks of wood to preserve them in their wear and to keep them level at the surface. Alternate rows of concrete are also placed with the blocks upon this foundation, so as to prevent their becoming slippery, and the blocks are coated and saturated with bituminous substances, to retard decay. By these means a pavement is produced which has no objections to it, and is comparatively cheap and very simple in its construction.

The tests which this pavement has undergone, and the great saving of horses and vehicles, as well as the increased comfort both to travelers and residents along the streets through which it has been laid, its durability and economy, demonstrate the value of the improvement.

It has been computed according to the testimony in the case that in New York and the adjacent cities, there are over 200,000 horses and a corresponding number of vehicles. These horses and vehicles cost from $100 to $1,000 each, while many of them cost more. It is also estimated that the lowest possible saving on each horse would, in seven years, be not less than $75, which on 200,000 horses, makes a saving of $15,000,000. It is further estimated that the average saving on each vehicle for the same time would be at least $100 or an aggregate in 200,000 vehicles of $20,000,000. It costs now on an average $30 per annum for the shoeing of a horse, one half of which it is thought might be saved by the use of the Nicolson wood pavement. The aggregate saving in shoeing would amount in these cities to $21,000,000. It would probably save in the same time $1,500,000 in the destruction of freights, and a like amount in the expense of cleaning the streets. This gives a total of $59,000,000. To which may be added sundry other gains resulting from the increased capacity of the streets, and increased speed of vehicles, the saving of the lives of thousands of horses, and diminishing the rates of insurance upon them; the saving of goods exposed for sale, from the accumulation of gritty dust; in the prevention of frost in gas and water pipes, the leakages of water into cellars and the improved sanitary condition of these cities. These accumulated savings were estimated to amount to not less than $7,000,000, which added to the increased value of real estate probably not less than $10,000,000 would swell the total saving to $76,000,000.

Last though not least to the humanitarian, will appear the prevention of cruelty to horses. To walk through Broadway, without seeing a horse down is a consummation which the Nicolson pavement would secure. We think this pavement, to be unquestionably superior to any stone pavement that has been or can be devised.

CORROSION OF IRON EXPOSED TO SALT WATER.

It is usually supposed that iron, either cast or wrought, is subject to rapid oxidation by being exposed to the action of sea water; or if alternately exposed to the action of water and the atmosphere. Many facts seem to support this theory, but there are others which would seem to denote that much of this action, instead of being attributed to external influences, is to be attributed, rather, to the nature and structure of the iron. Wrought iron is undoubtedly more subject to the influences of moisture and the atmosphere than cast iron; but the cannon of the *Royal George*, submerged nearly half a century, were so soft, when raised, as to be easily cut with a knife; yet cannon, sunk in the fresh-water lakes of our country in 1812, were found to be but slightly corroded when raised forty years afterward. We have, however, seen shot—cannon balls—sunk at the same time, in the same locality, and recovered at the same time, which appeared to be converted into plumbago, or a species of carburet of iron. We attribute these seemingly contradictory results to the difference in the quality of the metal acted upon.

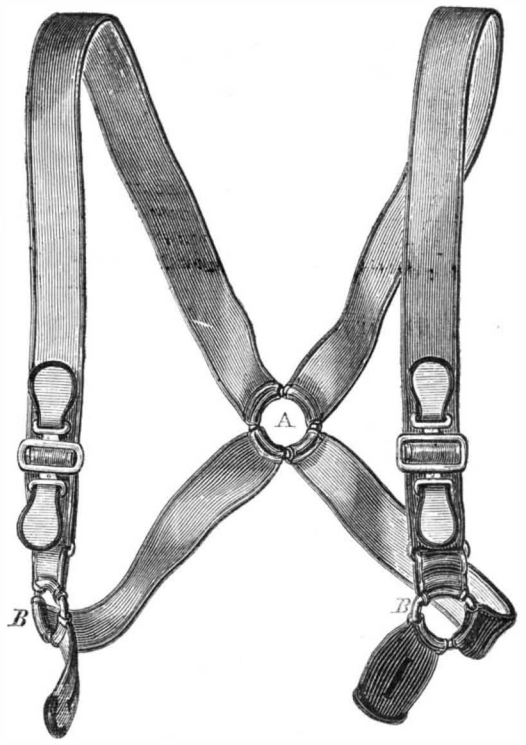
Cast iron, to resist corrosion, should be as hard as the circumstances of the case will admit, of an even, close grain, containing but little graphite, which is found so abundantly in ordinary soft iron, the filings from which will smut the fingers. Water pipes and gas pipes are too often cast from the refuse of the foundery, slag, scoria, etc., when they should be made of the most compact metal, hard, white iron.

A Scientific Toy.

An amusing, if not a very reliable, hygrometer may be constructed as follows:—Take an ordinary cigar box, and place a vertical upright rock shaft in its center. To this shaft attach a bar of light wood so as to form two equal arms on each side. Insert a staple at one end of the box; attach one end of a piece of small catgut (or a horse hair will do) to it, wind it twice around the vertical shaft and fasten the other end to a small coiled spring fastened to the other end of the box. The absorption of moisture will render the gut longer or shorter as the atmosphere is moist or dry, and the motion produced by the contraction or expansion of the gut and the spring will be communicated to the vertical shaft, and through it to the arms. If to the end of one arm a toy figure of a mower be attached, and to the other a figure holding an umbrella, openings being cut to represent doors in the side of the box, fronting each figure, the figure holding the umbrella will appear when the air is moist, and the haymaker when it is dry. Rain is more likely to occur when the air is moist, than when it is dry, and thus this toy will indicate, to some extent, the probability of rain. This is an amusing modification of the well known hair hygrometer. It may be added that the smaller the vertical shaft is made, the more delicate will be its operation. A box of considerable length in proportion to its other dimensions is best adapted to the purpose.

TOWLES' PATENT ELLIPTIC SUSPENDER.

We recollect an anecdote of a rigid Scotch Presbyterian, who, in advising his son against heretical influences, bid him beware of suspenders to his breeches. What connection the old gentleman could see between suspenders and theology we never could perceive, but that he might oppose pantaloon braces on the score of discomfort seems reasonable. In hot weather they are a nuisance; they bind and sweat the shoulders and prevent free movement of the body. Having pretty thoroughly tested the contrivance illustrated in the accompanying engravings, however, we are certain it is free from these objections; we have never before found anything of the sort so comfortable and so well adapted to give ease to the wearer in every position of the body.



The pantaloons are supported and suspended from two points only, these being under the arms and central. By reference to the engravings it will be seen that the strain and weight are equal in whatever position. From a common center or ring, A, on the back, both front and back webs draw equally, those which pass over the shoulder and those which pass under the arm uniting at rings, B, just forward and under each arm, with the buttoning-straps. As the straps across the shoulders are not elastic, chafing, perspiration, and binding are obviated. The larger engraving shows the brace alone, and the smaller its adaptation to the person. The point of bearing being in the center of the back, the webs which pass under the arms and down the front act as shoulder braces, tending to keep the chest expanded and the body erect. This gives a hygienic value to the device.

The patent, obtained through the Scientific American Patent Agency, was issued June 2, 1868. All communications should be addressed to Towles, Bro., & Co., Monumental Silk Works, Baltimore, Md.

Preservation of Oilcloths.

Oilcloths are often damaged by the use of soap containing too much caustic alkali in cleansing their surfaces. All vegetable oils which are adapted for use in painting, absorb oxygen upon exposure to the air, and assume resinous characters. The drying properties of such oils are increased by heating them with litharge, which, by partially oxidizing them, renders their complete oxidation a work of less time than would otherwise be the case. Oils thus treated are called "boiled oils." In this state they are used as a vehicle for the various pigments used in painting and in the manufacture of oilcloths. Resinous substances resulting from the oxidization of vegetable oils are strongly acted upon by the caustic alkalies. It will be seen, then, that the use of soaps containing an excess of soda or potash would be liable to destroy surfaces of oilcloths. To preserve them properly they should be washed with Castile soap only, and occasionally receive a coat of good copal varnish.

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NEW YORK, WEDNESDAY, JULY 22, 1868.

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NEEDLESS SACRIFICE OF LIFE AND PROPERTY.

One of the fundamental purposes for which governments are instituted among men, is to protect life and property, and this protection is supposed to increase in proportion to the intelligence of the people. It is therefore reasonable to suppose that, in these respects, our own country should occupy a leading place among the nations of the earth, but it has come to pass that Europeans look upon us as the most reckless people in the world, so far as our care of life and property is concerned. The impression is pretty well founded, and we are compelled to admit a want, to some extent, of those safeguards which are necessary to secure these desirable ends.

We all take a patriotic pride in celebrating the return of our national anniversary, but in so doing we have admitted certain practices, the unrestrained indulgence of which costs the loss of many precious lives and the destruction of much valuable property. The indiscriminate use of firearms in the hands of children and inexperienced persons, presents a yearly catalogue of fearful loss of life, limb, and property—the responsibility for which falls sometimes with crushing force upon our families as well as upon our authorities, who sanction the barbarous custom of celebrating the Fourth of July by the free discharge of mischievous crackers, rockets, pistols, and other missiles.

The authorities of this city, not content to let people purchase and explode their own ammunition, deliberately appropriated $30,000 of the people's money in the purchase of fireworks, which were burned up in less than thirty minutes. One thousand dollars per minute will strike all reasonable people as a pretty expensive exhibit of patriotism, especially when the thermometer stands at 90°, but there was a "ring job" in it, therefore remonstrance was thrown away upon our patriotic city fathers. The expense, however, of celebrating our national anniversary is nothing compared to the killing, and maiming, and burning, whereof the columns of our journals gave sorrowful witness. Two years ago the beautiful city of Portland was nearly reduced to ashes by the careless use of fireworks; and this year, in other places, a lamentable destruction of property followed from the same causes.

Are we never to learn any wholesome lessons from these heart-rending calamities? Must we still go on with the heathen practice of killing, maiming, and burning? These are serious questions, and should not be lightly treated by our people, who have it in their power to put a stop to the evil. Congress ought to interdict the importation, under heavy penalties, of the Chinese fire-crackers, the use of which has carried mourning into thousands of families. Not only should this nuisance be stopped, but instead of appropriating money to buy and burn fireworks, the manufacture of them ought also to be prohibited. Is it not enough that we are compelled to manufacture powder to kill each other in war, without taking the additional risk of having our lives and our property destroyed by fire-crackers and sky-rockets? It appears to us in sober reason, and, to use an every-day phrase, that it is about time for this dangerous game to "play out" forever. Hereafter let our patriotism be shown forth in safer and more reasonable manifestations.

We have thus indicated but one of the ways in which we show a reckless regard for life and property. Another and even more serious one is the loose management of our railways. We wish to make no invidious comparison in discussing this matter, but having frequent occasion to pass over the New York and New Haven road, we select it as an example, of what we propose to say on this subject. If we mistake not, twenty-five trains are run upon this road every day. They are usually run at a high speed so as to accommodate the impatient traveler, who is naturally anxious to reach his rural home. Populous villages and considerable cities are thickly scattered all along this great thoroughfare, and hundreds of streets, and public highways, run across its iron track. Yet, strange to say, the law does not require it, and the company sees fit not to adopt any proper safeguards to prevent people from being run over by the swiftly passing trains, and the consequence is that vehicles are knocked in pieces, and persons whose lives and limbs ought to be considered precious, are killed and maimed every year. Not only is this true in regard to the New Haven road, but it is also true of many others. The street and road crossings are not properly guarded, and the trains are allowed to rush on, pell-mell, with no other notice of their rapid approach, than the screeching of the whistle, which is really of little use, especially when trains are running at high speed, or are concealed from view in deep cuttings. No other people on the face of the earth, blessed with railroad facilities, are so careless in this respect as our own. Citizens whose lives and property are so imminently endangered, have sometimes petitioned to their legislatures for the application of safeguards, but hitherto to little or no purpose, as the companies always succeed in beating them off through wire-pulling and special committees. If these railways were non-paying, then there might be some little excuse for such negligence on the part of the directors, but they cannot plead poverty as an excuse; they therefore should be compelled to establish gates and maintain guards to close up the chief highways and streets during the passage of the trains.

THE INJUSTICE OF TRADES UNIONS.

We give place in this week's issue to a communication from an aggrieved employer who complains of what he considers an unwarrantable interference with his rights on the part of "Trades Unions." It is impossible to deal with the labor question at the present moment without treading upon the feelings and prejudices of two useful classes, viz: the employer and the employed. This should not be so, for the interest of these two classes are like the functions of the human body, so vitally connected that any serious injury to the one, causes a corresponding injury to the other. No writer, journalist, or statesman is worthy of confidence who fails to consider both these interests as entitled to favorable recognition. In the ordering of divine Providence, and according to the laws that govern all human industries, there must of necessity be two classes—the capitalist to supply the money, and the working man to supply the brawn and muscle. When these two classes are properly united, there must be progress, and an increase of the wealth and prosperity of both. No one fact is better understood, or more generally accepted in our country than that the "laborer is worthy of his hire" in other words, that the laboring and producing classes are entitled to a fair compensation for their labor. There are exceptions to this rule in practice, but we can wish prosperity to no man, or combination of men, who are not willing to pay their employés a fair price for their labor. For some years past there have been growing up very serious disturbances in the labor interests of the old country and as a natural consequence its influences have reached our shores. Mechanics have come to distrust employers, and employers have come to distrust mechanics, and the result is, that they have divided into hostile camps; each denouncing the other by resolutions and speeches similar to the hordes of scurvy politicians whose "god is their belly, and whose end is destruction." In the city of New York at this moment, more than two thousand mechanics are out of employment, and large building operations are suspended, simply because the bricklayers and the "boss" masons cannot agree upon terms. This is very unfortunate for brick-maker, brick-layer, "boss" laborer, tax-payer, rent-payer,—indeed all classes of trades people are more or less unfavorably affected by this disagreement.

We believe that outside parties, selfish schemers, have had much to do in bringing about this mischief, for it does not appear to us that the parties whose interests are so closely allied, could ever have reached so unhappy a condition, but for mischievous intermeddling. The sympathies of the SCIENTIFIC AMERICAN are naturally with our mechanics and the working classes, but we can never prostitute our columns to engender hostile feelings between them and their employers. Be it our mission rather to promote the interests of both, as we have hitherto striven to do—therefore we feel constrained to declare that in our judgment, some of the rules governing the Trades Unions are unjust, oppressive and entirely hostile to the spirit of our laws, and the sooner they are abolished the sooner will the rights and true interests of these mechanics be recognized. They have a right to fix the price of their own labor, but it cannot be tolerated in this free country, that a combination of men can band together and declare that a "boss" shall not work on his own job, or that he shall employ but two apprentices. Such a doctrine as this is simply monstrous, anti-republican, a serious violation of private rights, and will work injury to those who undertake to enforce it.

We could never admit for a moment the right of the assistant editors of this journal to say that the chief editor should not write for his own columns. No; such a proposition would not stand the application of either law or gospel. All right-minded mechanics and working men will at once admit the force of our position, therefore we say to them, the sooner they learn that their true interests, as well as their manhood, are seriously compromised by these "Trades Unions" the better it will be for them.

The "bosses" and the workmen should stop denouncing each other, and come together like reasonable men, and adjust their grievances. That is the true way.

GRANITE.

Granite is probably the most durable stone used for building purposes. It exists in greater or less abundance in the mountains of Scotland and Germany; the Alps, the Carpathean, the Uralian, and the Altaian mountains; the Andes, and the United States. By long continued friction with sand and emery a high polish may be given to its surface. The largest block of granite which has been quarried and transported in modern times, is the pedestal of the equestrian statue of Peter the Great, at St. Petersburgh. It is computed to weigh three million lbs., and was transported nine leagues. The method adopted for moving this immense mass was rolling it upon cannon balls. Those of iron being crushed, balls of bronze were substituted. The columns in the Pantheon, at Rome, are also of granite. They are thirty-six feet eight inches in hight. There are sixty granite columns at St. Petersburgh, composed each of a single stone twenty feet high. One of the most beautiful kinds of granite is called graphic granite. It is composed principally of feldspar and quartz. The feldspar may be considered the basis of this variety, in which the quartz, in various forms, lies embedded. When broken in a direction which is perpendicular to that in which the feldspar is traversed by the quartz, the fracture appears to have letters traced upon it in parallel lines. Its name was given to it on account of this fact. A most beautiful effect is produced by the seeming lines of grey letters upon a white or flesh-colored ground, when the stone is polished. A handsome white granite is found in various places in the eastern sections of the United States. It is the material used for the New Market House, the United States Bank, and the Tremont House, in Boston. We do not recollect seeing it elsewhere. It is doubtless the finest building stone quarried in this country.

RINGING IN THE EARS.

Whenever sounds are heard which cannot be referred to external causes, the phenomenon may be attributed to a depravation of the sense of hearing, usually traceable to the auditory apparatus. *Tinnitus aurium* is the name given to this complaint. A great variety of sounds are heard, like the hissing of steam, the roaring of water, the discharge of cannon, musical tones, human voices, etc.

Numerous causes may be assigned for this disagreeable complaint. The most common, however, is hyperemia, or a rush of blood to the head. The hyperemia may be acute or chronic, inflammatory, or due to such transient causes as a dependent position of the head, violent exercise or emotion, a full meal, or a glass of wine. Its agency may be shown by compression of the carotid artery, which will often relieve the tinnitus. Quinine in excessive doses induces this symptom. One case is reported in which a physician was afflicted with tinnitus for twenty years. He heard every variety of sound, even long conversations. Deaf mutes are stated to be frequently troubled with tinnitus. Chronic cases, dependent upon chronic inflammation of the middle ear seem to resist all treatment. The subject has latterly attracted considerable attention from suspicion that the continued administration of quinine endangers the sense of hearing. Tinnitus often depends upon the presence of cerumen or ear-wax. Relief can be obtained in such cases by syringing with warm water.

MECHANICS IN CALIFORNIA.

Several weeks ago we published the statement, drawn as we belived from reliable sources, to the effect that there was "a dearth of mechanics in California." This statement has attracted the notice of the *Daily Evening Bulletin*, a very influential paper published in San Francisco, which says "there has been a good demand for mechanics, especially for carpenters, this year, and, we believe, all competent workmen of this class have found ready employment." The *Bulletin* doubts, however, if there is any gap which requires any considerable accession of mechanics. We have also a letter from an intelligent engineer residing in San Francisco, who states that at present there is no want of mechanics in any department which would justify immigration. If mechanics go to California intending to become residents, their chances would be the same as other resident mechanics, some of whom, our correspondent says, are now compelled to accept employment as ordinary laborers.

It is a wise old saying that "a rolling stone gathers no moss." Mechanics and the working classes generally are best off when they stick to their steady employment, and avoid tramping, and all excesses or expensive habits.

LIGHTNING.

Those manifestations of atmospheric electricity which are called lightning are among the most interesting as well as the most grand and impressive of the phenomena of nature. In earlier ages very erroneous impressions prevailed as to the cause of lightning and thunder, and although at the present time, those who have given attention to the subject, have generally correct views, there still remains enough of popular error to justify further attention to it.

There are three varieties of lightning, viz., zigzag, or chain lighting as it is popularly called, sheet lightning, or that which is exhibited in sheets of light which illuminate a whole cloud, and globular lightning or that which takes the form of fire-balls. Chain and sheet lightning are so familiar to all that no description of their appearance is necessary. Globular lightning on the contrary, is very rarely seen, and is therefore a subject of great interest whenever it is observed.

It generally is seen to move slowly, and at times it remains stationary. It has never been known to move with the rapidity of chain lightning. The cause of this peculiar form

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of lightning is yet unaccounted for, and its extreme rarity renders it practically of small importance.

The ancient idea that the destructive effects of lightning were produced by the projection of a solid body from the clouds which was called a thunder bolt, is still entertained by many; and it is claimed that these bolts have been found imbedded in the sand at the point indicated by the course of discharge. The supposed thunder-bolts are hollow tubes coated on the interior with brilliant glass, and are formed of sand vitrified by the intense heat. They are winding in their form, often throwing out lateral spurs, or branches, and contracted in size toward the lowest extremity. They generally terminate at a spring of water or other good conductor of electricity. The diameters of the main tubes vary from four hundredths of an inch to three inches and a half; and they are often many yards in length. One is on record which was forty feet long. The thickness of the sides vary from one fiftieth of an inch to nearly an inch. These formations have received the name of fulgurites, and are of quite frequent occurrence upon the sandy plains of Silesia where they were first discovered.

There is a prevalent doubt in the popular mind as to the utility of lightning rods. Some grounds for distrust have been created by their improper construction and by the failure to attend to requisite repairs in season. The main cause of doubt is, however, to be attributed to want of knowledge in regard to the principles upon which they are constructed.

The action of a lightning rod depends upon the principles of electric induction, and the power which pointed conductors possess, of conducting away electricity silently and without explosive effects. The tension of electricity upon the surface of a sphere is everywhere uniform. On an ellipsoid the greatest tension is found at the extremities. Pointed rods may be regarded as modifications of the latter form, and when electrified the tension at their points becomes so great in proportion to their entire surface, that discharges take place in rapid succession and in so small quantity as to be harmless in their effects. Induction is the production of an opposite state of electricity in any body, by the proximity of another body positively or negatively electrified. Thus a cloud positively electrified would induce negative electricity in the earth below it, or, positive electricity if negatively electrified. A good conductor having one end in contact with the earth, and the other raised to a considerable height and terminating with points, restores the equilibrium between the two bodies, or so to speak, effects the recombination of the positive and negative electricities which renders them inert. This would not be done with a sudden and violent discharge, but by a series of minute discharges, which might be considered as practically a continuous flow. These discharges may take place from the cloud to the earth, or *vice versa*. It having been shown, however, that positive electricity passes through the air with greater facility than negative, it is probable that the discharge takes place in a direction from the positive to the negative, as the case may be. The discharges are most frequently from the clouds to the earth. In either case the discharge will follow—all other things being equal—the nearest conductor. If, then, the lightning rod is higher than any other part of a building within a certain distance, and is constructed of materials and of a size which render it a better conductor than the structure which it is designed to protect, it becomes a reliable safe-guard from the destructive effects of lightning.

It will be seen from these facts that the opinion that lightning-rods attract discharges of electricity, and thus endanger the safety of buildings has no foundation whatever. The conditions for a discharge must be established before it can take place through a lightning-rod or otherwise, and the employment of the rod is simply the substitution of a good and safe conductor for an imperfect and dangerous one.

DIFFERENCES IN OPINION.

Among the numerous causes of differences in opinion there is none more common than misconception. The peculiarity of the differences in opinion that arise from misconception is that they are rather apparent than real. It is often the case that parties engaged in hot dispute are surprised to find, that when they come to comprehend, fully, each others meaning, they agree perfectly.

Such disagreements are very apt to arise in the discussion of theories and hypotheses which can not be brought to the test of experiment, or subjected to rigid mathematical demonstration. In such discussions it is exceedingly difficult to express a proposition so clearly, or to give so complete definitions that the meaning intended shall be fully understood, and nothing more; and greater differences of opinion will be found in speculative philosophy than in the entire range of the positive sciencies.

Volumes have been written to defend diverse doctrines which are based upon different conceptions of the meaning of the word space. The same may be said of each of the words time, cause, effect, distance, force, existence, and many others. The meaning of the word poison has never been fully agreed upon. Of course we refer, not to the popular sense in which it is used, but to its scientific signification.

Nothing is so difficult as to define. This difficulty, and the great effort to avoid misconception, which speculative writers feel to be a necessity, is apt to give the reader the impression of heaviness and want of conciseness in the works of such authors. Such subjects can not be discussed hastily, or be understood by desultory and careless perusal. Each thought is labored, and its clear expression demands the severest and most critical use of language. The same critical analysis is required in its perusal, in order to properly conceive the author's meaning.

It seems to be one of the inevitable tendencies of language to saddle words with different significations. In ordinary conversation and communication, this does not occasion so much inconvenience as in scientific and philosophical discussion, yet even in our most common intercourse we often misunderstand each other from this cause.

It is necessary then, in order to avoid misconception in writing and talking upon scientific matters, to first state distinctly the meanings of the terms employed, and secondly, to so express all propositions that, if properly considered, there shall be little or no possibility of being misunderstood. It is also necessary in the conduct of a dispute upon such topics, to accept the significations given, and not to allow ourselves to substitute a signification of our own for that given by an opponent. If a definition of terms cannot be agreed upon, there is an end to profitable argument.

Such diversities of opinion, would more readily be harmonized were it not for the peculiar tendency of the mind to antagonistic action, rather than passive recipiency, in listening to the arguments of others. It is difficult to fix attention upon, and give due weight to the opinions and arguments of another, because it is hard to resist mentally framing arguments against them; and while the mind is thus engaged it is impossible to obtain the full force of the ideas advanced. Candid listeners are even more rare than candid talkers, and cool, dispassionate, and able thinkers, are rarer than either. It is well to consider these things when we find ourselves inclined to impatience with the views of others, and be perfectly sure that our differences are not such as arise from mutual misunderstanding.

$250,000 FOR STAMP ERASER.

It is announced that Marcus P. Norton, of Troy, N. Y. has been awarded the sum of $250,000 for the past use of his patent for canceling stamps, illustrated upon page 104, vol. IX, SCIENTIFIC AMERICAN. The report is that the Court of Claims certified their decision to Congress, and asked that a bill might pass, covering this amount in favor of Mr. Norton, which recommendation was promptly acted upon by Congress and the President's ten days for signing the bill expired a few days since. We have not seen the official report of these proceedings, but if true, we cannot but regard the transaction as extremely questionable.

The invention has been in use about five years, and the award is equal to $50,000 a year, or at the rate of $850,000 for the full term of the patent.

We are always pleased to record the success of inventors, but we should take no pleasure in allowing the people to be taxed after this fashion, and for an invention involving so little ingenuity. We do not believe the story.

SHOES.—It is said that a coat of gum copal varnish applied to the soles of boots and shoes, and repeated as it dries, until the pores are filled and the surface shines like polished mahogany, will make the soles waterproof, and also cause them to last three times as long as ordinary soles. We are inclined to think however that the sole would by this operation be rendered so inelastic as to endanger the integrity of the uppers, and also to render the boot uncomfortable to the foot On boots however made of very stout leather and with very heavy soles this might not prove an objection.

ALFRED NOBEL'S nitroglycerin manufactory at Stockholm, Sweden, was recently blown up. Fifteen persons were killed and several seriously injured. The destruction of property in the neighborhood was also extensive. This occurrence, if any further evidence was required in addition to what was lately given by successive violent and fatal explosions, shows the extremely dangerous nature of nitroglycerin, and will do much toward weakening the statements lately made by Mr. Nobel, in leading European papers, with regard to the comparative safety of this compound.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING JULY 7, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

79,535.—MANUFACTURE OF VULCANIZED INDIA-RUBBER Balls.—Henry A. Alden, Matteawan, N. Y., assignor to The New York Rubber Company, New York city.

I claim, 1, The method of forming the valve for the admission and discharge of air into and from rubber balls, or other hollow articles requiring to be distended by inflation, substantially in the manner herein shown and described.

2, A vulcanized India-rubber ball, or other like hollow article, the aperture or opening in which, for the passage of air, is closed by an elastic valve piece, provided with a slit or valve opening, d, and applied to the interior surface of the ball, substantially as herein set forth.

3, The employment, in connection with the chamber or opening formed in the ball, and the elastic valve piece, for closing said chamber, of a shot, or its equivalent, inserted in said chamber, so as to close the valve tightly, and prevent the entrance of dirt, as set forth.

79,536.—BOTTLE STOPPER.—Joseph Bell Alexander, Washington, D.C.

I claim, 1, The combination of the staff A and disk D with the rubber body F, when united by the process of vulcanization, substantially as described, and for the purpose set forth.

2, In combination with the above, the device composed of the button, G, and the string, H, for attaching the stopper to the neck of the bottle, substantially as described, and for the purpose set forth.

79,537.—MILL-SPINDLE SPRING.—Thomas Alsop, Elkhart, I

I claim the spindle C and pinion D, in combination with the spring C', when the same is connected with the spindle and pinion by means of the projecting pin c' and removeable bolt c", and the whole is constructed and arranged substantially as and for the purpose specified.

79,538.—FOG ALARM.—John R. Anderson, Brooklyn, N. Y.

I claim the arrangement of the trumpet or horn, B, and hollow plunger, C, relatively to each other, and with the cylinder A substantially as herein described for the purpose set forth.

79,539.—HARVESTER RAKE.—Charles J. Arlington, Auburn, N.Y., assignor to C. Wheeler, Jr.

I claim, in a combined "reel rake," the arms of which are hinged to a head, moving around an axis nearly perpendicular to the platform, the rake-heads so hinged to their arms, and combined with springs, that their teeth shall be retained in a position nearly parallel to the platform in reeling, in combination with mechanism under the control of the operator, so that he can bring their teeth to a vertical position at pleasure, for the purpose of raking, substantially as described.

Also, the combination, substantially as described, of a continuous fixed camway, for guiding the rake and reel arms, and a second moveable cam, which, when raised by the attendant, forms a guideway outside the first track, for controlling the rakes.

Also, the spring, L, in combination with the arms, I, for the purpose of keeping the wings, M, in proper working position, substantially as described.

Also, the spring, P, as combined with the rake, N, and wing, M, for the purpose of keeping the rake out of the way of the grain in the process of reeling, substantially as described

79,540.—GARDEN IMPLEMENT.—James Armstrong, Bucyrus, Ohio.

I claim the sliding of the handle, A, through the eye of the frame, B, so as to lock the lower roller, C, by coming in contact with the teeth of said lower roller, in combination with all the other devices aforesaid, as herein described for the purposes set forth.

79,541.—RAILROAD CAR VENTILATOR.—G. W. R. Bayley and John McCluskey, Algiers, La.

We claim the arrangement of the connecting rods, D and D2, with the connecting rods, F and F2, forming a series of operating-mechanism for opening and closing the windows, in the manner and for the purposes described,

79,542.—CHURN.—S. Besser, Dorchester, Ill., assignor to himself and James Draper, St. Louis, Mo.

I claim the dasher rod, C, when provided with a spiral groove, c1, and combined with the wheel, A, and connecting rod, B, and engaged by the pin c2, so as to produce a combined motion, as set forth.

79,543.—VEGETABLE SERVER.—Theodore F. Bigelow, Boston, Mass.

I claim the apparatus above described, consisting of the base, A, the top B, the rollers, C, and a journal, arranged and operating substantially as described, when the same is made portable so as to be used on any ordinary table.

79,544.—STEAM GENERATOR.—William Branagan, Burlington, Iowa.

I claim, 1st, The fire-chamber, A, terminating in a gas-chamber, A', and with a curved top-plate, in combination with the horizontal flues, a a, and with the bent or angular water-pipes, D, and with the outer case or water-jacket, C, the said pipes D being inserted into the jacket by horizontal branches at points below the gas chamber and below the first horizontal flue, a, and the several parts being constructed and arranged together, substantially as described.

2d, The angular water pipes, D, arranged directly in a line with the flues, a a, and inserted into the outer case or jacket, C, and applied in the space G all around the case C and below the crown sheet A' of the fire box or chamber, all substantially in the manner and for the purposes described.

3d, A double-wall air-heating jacket, E, applied to a steam-boiler, substantially as and for the purposes described.

79,545.—GAS BURNER.—J. S. Bridgman and Edwin G. Wellman, Brockport, N. Y.

We claim the branched burner, A A, provided with the vertical nipples, a a, and horizontal nipples, a' a', arranged as described, and operating in the manner and for the purpose specified.

79,546.—CHEESE SAFE, GAGE, AND CUTTER.—Edwin G. Bulgin, Vienna, N. J.

I claim, 1st, The sliding doors, G and H, as arranged and combined with a rotary bottom and a cutting apparatus, for the purposes set forth.

2d The arrangement and combination of the cutting knife, K, hand lever, d, regulating-screw, f, with a cheese safe, as described, for the purposes herein set forth.

3d, The graduated scale or index plate, L, the sliding plate, M, with its index finger, e, and the marker, i, as connected with a cheese-safe, for the purpose set forth.

79,547.—PLOW.—William D. Burgess and George W. Zeigler, Maumee, Ohio.

We claim, 1st, The standard, C, constructed with a draught eye, c, parallel flanges, c', lugs, g g, and a point C', adapted for receiving and having secured to it the shovel plate, J, and laterally-projecting hilling wings, G G, substantially as described.

2d, The clevis, E, constructed with an eye, e, upon its front end, and also with a flanged slotted segmental portion, i, upon its rear end, substantially as described.

3d, The stand, K, constructed with a slotted foot piece, and a segmental elevation, the latter having recessed flanges formed upon it, substantially as described.

4th, Securing the handle support, K, to the beam, A, by means of the screw or bolt, o, which is used for securing the standard to said beam, substantially as described.

79,548.—MACHINE FOR MAKING TIN-LINED LEAD PIPE.—S. E. Chubbuck, (assignor to J. H. Chadwick), Boston, Mass.

I claim 1st, The combination of the annular fixed partition, D, with the cylinder, ram, and die, when all are arranged in relation one to another, as and so as to operate in the manner described.

2d, The construction and adaptation, one to the other, and to the mandrel, of the ram and annular partition, D, as shown and described.

79,549.—MACHINE FOR MAKING TIN-LINED LEAD PIPE.—S. E. Chubbuck and J. H. Chadwick (assignors to J. H. Chadwick), Boston, Mass.

We claim the combination of the annular reciprocating casing, d, with the ram, cylinder, and die, when all are arranged, relative one to the other, as and so as to operate in the manner described.

79,550.—GUARD FASTENER FOR DOORS.—E. C. Cochrane, Buffalo, N. Y., assignor to himself and J. B. White, same place.

I claim, 1st, The combination of a hinged bar attached to the jamb, and an arm attached to the door, for engagement with each other, substantially as and for the purpose set forth.

2d, The slot, c, of the hinged bar, enlarged at its inner end, to permit the disengagement of the arm from the rod only when the door is closed.

79,551.—HARVESTER.—J. F. Coddington, Bound Brook, N.J.

I claim, 1st, The arrangement of shaft c', carrying the bevel pinion, c*, and spur wheel, d, and the shaft, f, furnished with the spur pinion, d* and crank, f*, at that part of the main frame in front of axle, and between the wheels, B*, and operating in connection with the bevel-wheel, c, on the axle, and the pitman, f*, of the sickle, substantially as and for the purpose specified.

2d, The elbow-lever, m, constructed with a spring or yielding arm, m*, for operating the sliding-clutch wheel, d, substantially as set forth.

3d, The arrangement of the elbow-lever, m, circumferentially grooved hub, i, of the bevel-wheel, c, lever, r, and standard, s, substantially as and for the purpose specified.

4th, The transverse sliding piece, z, arranged at the inner end of the finger bar, c*, and in relation with the sickle, C, substantially as and for the purpose specified.

79,552.—QUILTING FRAME.—Mrs. Lois A. Collard, Plainview, Minn

I claim the combination of the hinged sides, A A, and their cogs with the four hinged legs, B B, having two staples on each, through which passes a pin, as and for the purposes set forth.

79,553.—VELOCIPEDE.—B. P. Crandall, New York city.

I claim, 1st, In velocipedes, the combination, with the operating lever, J, of the tubular support, K, constructed of a hollow tube, K, having flanges, R, and the independent screw, L, as applied to the seat, I, in the manner and for the purpose specified.

2d, As an improvement in the mode of operating the steering apparatus of velocipedes, the parallel rods, E, having one end pivoted to the axle of the forward wheels, D, and the other end to the yoke, F, whereby the said yoke and axle always move parallel to each other, substantially as described.

79,554.—PRESERVING WOOD.—Charles M. Cresson, Philadelphia, Pa.

I claim the employment of heated air or other heated fixed gas, for the purpose of volatilizing or assisting in the volatilization of coal tar, resin, or other oleaginous or volatile substances, or of carrying or transferring the vapors of coal tar, resin, or other oleaginous or volatile substances, when thus or otherwise produced, to a chamber or receptacle, in order to be used therein in expelling the moisture from the timber or wood, or seasoning the same, or in saturating the same with vapors as a preservative against decay or rot, substantially in the manner and for the purposes above set forth.

Also, the seasoning or preparatory treatment of wood or timber by the method above described, in which the temperature of the vapors is elevated to a point above the temperature of the chamber containing the wood or timber, and the temperature of the wood or timber is, in cooling, allowed to fall more rapidly than that of the vapors, substantially in the manner and for the purposes hereinbefore mentioned.

Also, the treatment of rail road ties, piles, and other timbers, by vapors, as above mentioned, in combination with the subsequent application of a hot-bath of carbolic acid, or of petroleum oils, or of paraffine or other protecting substance, or as a preparatory treatment for the application of metallic or earthy solutions, substantially in the manner above described.

Also, the arrangement and combination of the coil, distilling-vessel, and wood-chamber above mentioned, the whole being constructed and operating substantially in the manner and for the purposes aforesaid.

79,555.—CAR-AXLE.—Rowland Cromelien, Washington, D.C.

I claim the construction of the swelled axles A A' when made hollow, and with inner shoulders and nuts, a a', and enclosing the bolt D with its spring E E, all as arranged, and combined with the outer clamps as and for the purpose set forth.

79,556.—SHUTTLE.—Alexander H. Damon and James Whitaker, Lowell, Mass. assignors to Eaton & Ayer, Nashua, N. H.

We claim, 1st, The forked stud, constructed substantially as described, and combined with a plate, a, and applied to the slotted-eyed shuttle, for the purpose set forth.

2d, The slotted curved plate, a, in combination with the screw, 10, the forked stud, and brushing, v, and the shuttle, for the purpose and substantially as described.

79,557.—SHUTTLE FOR LOOMS.—Alexander M. Damon and James Whitaker, Lowell, Mass., assignors to Eaton & Ayer, Nashua, N.H.

We claim, 1st, In combination with the guide pins at the sides of the eye of the shuttle, the concentric plate, supporting stud, b, and plate, a, which covers the slot, c, in the side of the shuttle, and in manner and for the purpose described.

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2d, The plate. a, and eccentric supporting stud, b, when arranged and combined with the slotted eyed shuttle for the purpose and substantially as described.

3d, The combination, with the slotted-eyed shuttle, of the plate, a, the plate being arranged over and serving as a cover for the slot.

79,558.—MACHINE FOR FILTERING AND REFINING SUGAR.—Albert Ludwig George Dehne, Halle on Saale, Prussia.

I claim, 1st, The combination, with filtering chambers or spaces formed by and between the frames C C', of the inlet-pipe, a, arranged by or in connection with pockets B and canal, r, formed by apertures, a, in the sides of the pockets and holes in the frames, to introduce the juice or fluid at or to the lower parts of the chambers, m, substantially as specified.

2d, The swinging or moveable pockets, B, having apertures a, through their sides, in combination with the frames, C C', having holes therein to form a continuous channel, r, essentially as shown and described.

3d, The canal, r, in the lower part of the frame of a filtering-apparatus, formed by the pockets and holes in the frame as described, in combination with the cocks f' to the spaces e of the frames, cock, g, water-cock, h, canal, i, with its branches, k, substantially as and for the purpose or purposes herein set forth.

4th, The combination, to form a filtering cloth between the frames of the press, or of adjacent sheets or layers of cotton and linen trellis, as herein set forth.

79,559.—WATER METER.—William B. Durant, Cambridge, Mass.

I claim the combination of the receiving-chamber, B, provided with a series of discharging tubes, b, as described, the pan C, the chamber F, the discharging tube, h, the receiver, E, provided with a pipe to discharge into the chamber F, and one or more tilting-vessels, H, placed underneath or below the tube, and to operate as described.

Also, the combination of the above, and mechanism, substantially as described, for effecting the intermittent rotary motion of the receiver, E, as and for the purpose described, such mechanism being the projections, p q, the shaft, l, 'scape wheel, m, escapement, n, and arm, r, the whole being substantially as specified.

Also, the combination and arrangement of the box, I, provided with an orifice, s, with tilting vessels, H and K, combined and to operate with the chamber, B, its tube, b, the pan, C, the chamber, F, and the receiver E, in manner substantially as described.

Also, the combination and arrangement of the auxillary tilting-vessel, G, and its induction-tube, g, with the vessel, H, the pan, C, the space or chamber, B, provided with a series of discharge-tubes, b, to operate as described, the vessels, G and H being fastened together so as to move simultaneously and in the same manner, as and for the purpose explained.

79,560.—TEMPORARY BINDER.—George W. Emerson, Chicago, Ill.

I claim the steel-tempered hoop-skirt wire, C, or other suitable material, in combination with the fastenings, D, one or more, or equivalent, the needles, F, and the cords, E, one or more, substantially as and for the purpose set forth.

79,561.—DYNAMOMETER.—James Emerson, Lowell, Mass.

I claim, 1st, Connecting the rim of the pulley, C, to the automatic indicating arm, h, when constructed substantially as described for the purpose named.

2d, The arrangement of the stop, o, in connection with the forked ends of the spider, E, so that the pulley, C, will be clutched to the spider, when the arm, h, is raised as described, for the purpose of taking the end pressure from the shaft, and to save the dynamometer from useless wear.

3d, Making the collar, d, oval in form, to prevent its resting on the neck of the collar, f, also chambering it as shown, to hold packing for the purpose of constantly lubricating the neck of the collar, f.

4th, The arrangement of the screws, j j and x, with nuts, each side of the eye-bolt, k, and the holders, t, that the connecting chains may be properly adjusted in length.

5th, The spring, v, for the purpose named.

6th Pivoting the eye-bolt, k, in the arm, J, in the manner and for the purpose substantially as described.

79,562.—DYNAMOMETER.—James Emerson, Lowell, Mass.

I claim, 1st, connecting the rim of the driving pulley, C, placed loosely upon the shaft, E, to the weighing scale, in the manner and for the purpose as set forth.

2d, Supporting the driving pulley, C, upon the shaft by means of the screws d d, as and for the purpose set forth.

3d, The connecting links, i, supported upon the knife edges, i i, as and for the purpose set forth.

4th, The spring, t, connecting the fulcrum bar with the driving pulley, when used as and for the purpose described.

5th, In combination with the driving pulley, C, fulcrum bar, D, and weighing scale, when connected and operating as and for the purpose described.

79,563.—HYDROCARBON BURNER.—H. Everett, New York city.

Antedated Feb. 8, 1868.

I claim, 1st, A liquid-fuel furnace, constructed substantially as described, and as and for the purposes specified.

2d, The combustion chamber, B, in the form of an elongated semi-circle, constructed of fire proof material, and supplied with the rarefying chamber, b, and the pipe or pipes, c, for admitting air or steam thereto, the whole forming the upper portion of a liquid-fuel furnace, incombination with the corrugated and slotted burner plate, A, forming the base thereof, the whole arranged substantially as and for the purposes specified.

3d, The refractor, e, for dividing and distributing the jets of steam or currents of air, arranged substantially as and for the purposes set forth.

4th, The mode, herein described, of admitting and employing liquid fuel, air, and steam through and upon the burner plate, A, together with superheated air or steam, admitted through the rarefying chamber, b, for the purpose or facilitating the combustion of said fuel, the whole arranged substantially as described.

79,564.—CONSTRUCTION OF SHEET METAL COAL HODS.—M. G. Fagan, Troy, N. Y.

I claim a coal hod or scuttle, made in the manner and for the purpose set forth in this specification.

79,565.—CARPENTERS' VISE.—Orlando V. Flora, Madison, assignor to himself, George Shannon, and D. C. Robinson, Jefferson county, Ind.

I claim the combination of the saddle piece, G, with the short ratchet on the end of the brace, H, having the vertically slotted opening in the said ratchet brace, thus rendering the disengagement of the ratchets, c and d, automatic when the article clamped is released, substantially as specified.

79,566.—VISE.—O. V. Flora, Madison, assignor to himself, G. Shannon, and D. C. Robinson, Jefferson county, Ind.

I claim, 1st, The combination of the jaw, B, vibrating washer, E, and screw, D, all constructed and arranged substantially as described.

2d, The jaw, B, with lugs, G, on the lower end of its shank, in combination with the supports, F, and gib, n, all constructed and arranged substantially as described.

79,567.—GALVANIC BATTERY.—Alfred C. Garratt, Boston, Mass

I make the said battery, as constructed with the bars so arranged that there shall be a narrow open space, as described, on each side of every bar, and with the bars of each pair of dissimilar metals insulated by means as described and the several pairs connected by metallic connections at their ends, the whole being substantially as hereinbefore explained.

Also, the formation of one of the bars of each pair with projections or abutments extended from it at or near its ends, such being substantially as and for the purpose described.

Also, the combination of the batteries by hinges and a chain, or its equivalent, as described, the whole being as and for the purpose specified.

79,568.—TEAT CUP FOR MILKING.—Benjamin F. Graves, Groton, Mass.

I claim a teat cup, to be used in milking cows, constructed and operating substantially as above described.

79,569.—LANTERN.—E. J. Hale, Foxcroft, Me.

I claim the combination of the glass chimney and air deflector, or either, with the door, so as to be capable of being moved with and by it, with respect to the lamp, in manner as described, when such lamp is in the case.

Also, the lamp as made quadrantal in form, and hinged at its radial center to the lantern case, as set forth.

And with the lamp and its chimney, applied to separate doors of the lantern case, the arrangement of either door so as, when closed, to lap on and keep the other closed, as specified.

79,570.—SULKY CULTIVATOR.—William Harvey, Volga City, Iowa.

I claim, 1st, The combined arrangement of the shovels, F F', supporting chains, I I', perforated straps, J J', and wooden pins, j, the rock bar, K k k1, elevating chains, L L', and treadle, M m', and the dodging chains, O, and treadles, N, all as represented and described for the purpose set forth.

2d, The hooks, P P', employed, in combination with the inner shovels, F F, to adjust said shovels relatively to the row, substantially as and for the purpose specified.

79,571.—FURNITURE CASTER.—J. W. Hewitt and G. R Lynch, Allegheny City, Pa.

We claim the combination of the eccentric cams, G, and connecting links, I, with the supports, D, guides, E, wheels, C, and frame legs, S, when arranged and operating as and for the purpose set forth.

79,572.—TREADLE FOR MACHINERY.—Alonzo Hitchcock, New York city.

I claim, 1st, The use of two connection rods for driving sewing machines, or analogous machines, when the two connection rods form the two legs of a triangle, the crank pin being the apex of said triangle, and when the two other ends of the connection rods that form the legs of the triangle unite with two separate treadles or levers to operate substantially as set forth.

2d. The use of two independent treadles or levers to revolve a crank shaft or wheel, when the two treadles are connected to the same crank pin by two connection rods, substantially as herein set forth.

79,573.—OIL-TANK CAR.—G. W. Ilgenfritz and M. Schall, York, Pa.

We claim, 1, A metallic tank, B, for railroad oil cars, formed by bellying a cylindric tube midway between its ends and on its lowest side, and furnishing this tube with heads, a small filling gage, passage or passages, a safety dome and discharge passage, which latter is at the convergent point of the bellying or lowest portion of the tank, all substantially as described and for the purpose set forth.

2d, The construction of the car bed or platform, so as to receive the tank or reservoir, B, between its sills, G, and upon chairs, g g, which are located below the top of said bed or platform, substantially as described.

3d, A railroad oil tank car bed, having a depressed tank, B, upon it, and inclined brace and stay pieces, C C, applied to its ends, substantially as described.

79,574.—CULINARY VESSEL.—C. A. Johnson, Des Moines, Iowa.

I claim the pots, A and B, fitted together, and connected by means of the spout, F, pipe, E, and covers, C and D, when used substantially as and for the purpose set forth.

79,575.—HARVESTER.—Samuel Johnston, Syracuse, N. Y.

I claim, 1st, The combination of the grain wheel, bracket, ratchet, and spring pawl, for raising and lowering the outer end of the platform.

2d, The combination of the bent lever, slotted wedge, and hinged tongue, for tilting the platform and cutting apparatus.

3d, The combination of an adjustable grain wheel, a platform, and gear frame, movable perpendicularly up and down on the main axle plate, and a hinged tongue and lever for tilting the platform and cutting apparatus.

4th, The employment of a double cam way or track provided with a movable switch, adapted to be moved by the revolving rake and reel arm, for changing the path of said arm.

5th, The eccentric lever, x, or its equivalent, for operating the movable cam way, substantially as described.

79,576.—CORN PLANTER.—Harris Keeney, Danville, and C. H. See, New Florence, Mo.

We claim, 1st, The combination and arrangement of the devices, D D' d d1 d2 d3, for dropping the seeds, substantially in the manner herein shown and described.

2d, The caster wheel, B1, the lever, F, and rack, f, when arranged with reference to each other, and to the frame, A, as herein described, for the purpose of turning and elevating the front end of the machine.

79,577.—ANIMAL TRAP.—Joseph Kohler, Cincinnati, Ohio.

I claim the arrangement of the base or foot A, and shaft, B, with the sliding cage, E, slotted sleeve, D d, bearing point, G, bait hook, H h, and pivot, I, or their equivalents, substantially as herein described and for the purpose set forth.

79,578.—SPRING.—Wm. Kroeger, Allegheny City, Pa Antedated June 24, 1868.

I claim a spring, constructed and operating substantially as herein described and for the purpose set forth.

79 579.—SEWING MACHINE.—H. P. Lamson, Lowell, Mass.

I claim the guide piece, p, formed with a spring thread guide to yield against the pressure of the needle, and then to carry the thread athwart its path, and also with another guide piece, serving to govern the path of the thread as well as to close the needle barb.

Also, the spring guide, p, in combination with the cloth table of a sewing machine, and with a flexible barbed needle, operating substantially as and for the purpose set forth.

79,580.—CLOAK AND COAT SUSPENDER.—J. D. Leach, Penobscot, and E. S. Wardwell, Bucksport, Me.

We claim the coat and cloak suspender, E, when constructed of iron or other suitable material, and formed with its upper convexity of line, its backward horizontal curve from the ends to the center, its vertical curve, and the hook or loop, e, formed relative to the body of the suspender, so that the center of gravity of the suspender, and the garment hung thereon, shall coincide, all substantially as described and shown.

79,581.—QUARTZ MILL.—Alpheus Lewis, Virginia City, Montana.

I claim the train of gear wheels, E E E, in combination with the series of stamps, D D D, whose stems, C C C, pass up through the eyes of the gear wheels, E, and derive a constant rotation therefrom, substadtially as and for the purposes set forth.

79,582.—LEVEL.—H. G. Loomis, Hartford, Conn.

I claim a carpenters' or masons' level, having a folding leaf, A, furnished with a sight, m, at one end of the frame, and at the other a graduated slide, B, furnished with a sight, n, sliding vertically in grooves, to adjust it to different elevations, substantially as herein described.

79,583.—SCALE.—C. C. Lyman, Edinboro, Pa.

I claim, 1st, The short platform, B, when so arranged in relation to the weighing apparatus and car that the scale will be at rest and free when the wheels are not upon the platform, and so operating that each end of a car will be weighed and registered automatically while in motion over the platform, substantially as and for the purpose set forth.

2d, The series of counter weights, I, and lifting shaft, J, in combination with the beam, D, substantially as and for the purpose set forth.

3d, The lifting shaft, J, slide and block, N, in combination with the loops, a a and b, arranged and operating substantially as and for the purpose set forth.

4th, The index wheels, H G, and lug wheel, I, in combination with the cheek or lock, A', arranged in relation to each other, and operating substantially as and for the purpose set forth.

5th, The loops, a' b, in combination with the index wheels, G H, slide block N, and lifting shaft, J, substantially as and for the purpose set forth.

79,584.—WAGON POLE.—J. R. Madison and M. Thomas, Oneida, Ill. Antedated June 30, 1868.

We claim, 1st, Connecting the neck yoke, E, to the ferrule by means of the bolt, H, and the bail, G, substantially as and for the purpose set forth.

2d, The combination of the ferrule, B, with its hook, C yoke, E, bail, G, and nut, H, substantially as and for the purposes set forth.

79,585.—WATER WHEEL.—S. W. Marsh, Rochester, N. Y.

I claim the partitions, C, attached to the case, B, and the portions, D, of the gates, C, forming the vertical sides of the chutes, k, when both are flexible, and free to yield at their inner ends, to allow the escape of obstructions, substantially as set forth.

79,586.—HAY AND MANURE FORK.—A. J. Martin, Catskill, N. Y.

I claim the combination of the handle, A, ferrule, B, adjustable tines, C C, screw, o, and nut, a, substantially as and for the purposes herein set forth.

79,587.—SPIKE DRAWER.—I. W. Mead (assignor to himself and E. W. Hanford), Bridgeport, Conn.

I claim the lever, A, with the lifter, B, the pair of levers, C, and the spring, b, constructed to operate substantially as herein described and set forth.

79,588.—CORN PLANTER.—H. Mitchell, Osborn, Ohio.

I claim, 1st, The construction of the belt H, elevators, G G, rollers, J and Q, and valve, K, when arranged, combined, and operating as herein described and for the purpose set forth.

2d, The shape and construction of the corn box, A, with its chamber, B, in front, and discharge pipe, C, at the bottom of the chamber, substantially as set forth.

3d, The rollers, P U and S, belt, R, shifting lever, T, rollers Q and J, when arranged and operated as herein described and for the purposes set forth.

4th, The arrangement of the plow, V, with the adjustable lever, W, brace chain, X, scraper, Y, and roller, Z, when regulated and operated on the under side of the machine, as herein described and for the purpose set forth.

79,589.—SIEVE.—Geo. Mohler, Yates City, Ill.

I claim the combination of the swinging and adjustable sieve, H, and the conical shaped feeder, P, whose apex extends up into the slotted bottom of the hopper, J, and operates with the box, H', in the manner set forth.

79,590.—STOVE GRATE.—E. Moneuse and L. Duparquet, New York city.

We claim the lever, h, and catch, l, applied substantially as specified, for sustaining the swinging grate.

79,591.—PIANOFORTE.—G. W. Neill, Boston, Mass.

I claim the combination of the wooden-back frame, B, the sounding board, C, and flanged plate, D, with a separate metallic frame, A, arranged between the back frame and sounding board, and made with flanges, to support the latter, and having no metallic bars or auxiliary frame to extend between the strings, the whole being substantially as described.

79,592.—DEVICE FOR CONNECTING DISSIMILAR HOSE COUPLINGS.—W. H. Paige (assignor to himself and L. O. Hanson), Springfield, Mass.

I claim a connection for hose couplings, said connection consisting of a tube, terminating at its ends in devices corresponding with and adapted for attachment to dissimilar hose couplings or connecting devices, substantially as described.

79,593.—CLOTHESLINE HOLDER.—O. S. Perkins and John R. Richards, Mount Joy, Pa., assignors to themselves and Joseph H. Ferguson.

We claim, 1st, A pulley wheel, with hooks formed of its outer rim, or equivalent, in the manner shown, and for the purpose specified.

2d, A hooked pulley wheel all combined and arranged in the manner shown and specified, and for the purpose set forth.

79,594.—BASE-BURNING STOVE.—J. S. Perry (assignor to J. S. Perry, trustee and executor, and N. B. Perry), Albany, N. Y.

I claim, 1st, In a base burning magazine stove, wherein the products of combustion are carried directly upward from the fire pot, the flue chamber, N, extending partly around and beyond the body of the casing, I substantially as described.

2d, The laterally projecting flue chamber, N, constructed with side divisions, p' p', bottom division, p, and deflecting plates, s', and applied to a stove which is constructed upon the principle herein described.

3d, An elevated oven, S, applied on top of the coal magazine, H, in combination with a flue chamber, N, which projects beyond the body of the casing I, substantially as described.

4th, Providing for exposing the outer portion of the bottom of the elevated oven, S, to the heated products of combustion, in combination with an extended flue chamber, N, and in a stove constructed substantially as described.

5th, Providing an oven, S, with a register, I, and opening, r, when employed in combination with an extended flue chamber, N, arranged as described.

79,595.—BRICK KILN.—F. Power, St. Louis, Mo.

I claim, 1st, The kiln, A, and drying chambers, A1 A2 A3, when combined and arranged as herein shown and described.

2d, The turn tables, F F1 F2, when combined with the drying chambers and kiln, as described and set forth.

79,596.—COMBINED CARD AND BRUSH.—W. H. Prouty, Hanson, Mass.

I claim the combination of the card or comb and brush, in one instrument, to be used together at the same time, for the purposes specified.

79,597.—ATTACHING DOOR KNOBS TO THEIR SPINDLES.—Silas S Putnam, Dorchester, Mass.

I claim the regulating screw, b, in combination with the knob, A, and spindle, B, substantially as described for the purpose set forth.

79,598.—CULTIVATOR.—N. A. Rand, Winslow, Ill.

I claim the arrangement of the pivoted bars, C C (that connect with the cultivator beams, D D), and the movable seat bar, K, between the axle and the frame piece, I, whereby the operator can shift the shovels by the action of his feet, the several parts being constructed to operate substantially as set forth.

79,599.—PUTTING UP ALKALIES.—John Reakirt (assignor to himself, Daniel Phreaner, and Tryon Reakirt), Philadelphia, Pa.

I claim packing caustic alkalies in a glazed jar or case, A, having a shoulder or flange, a, to support the disk or plate, B, when the whole is hermetically sealed with the cement herein named, substantially as described, and for the purpose specified.

79,600.—TRACK CLEARER FOR RAILROADS.—Christian F. Riley (assignor to himself and Jacob P. David), Philadelphia, Pa.

I claim a life and limb protecting track clearer for railway cars, consisting of a foot, A, and leg, a', constructed and applied in front of the wheels, so as to move upward and downward in the vertical direction described, from any unevenness of the track during the forward motion of the car, and so that its forward end may under-run and turn aside the limbs or body of a person fallen or lying upon the track, substantially in the manner described.

79,601.—PRESERVING COMPOSITION ROOFS.—Frederick O. Rogers, Niles, Mich.

I claim the within described method of preserving cement and composition roofs, substantially as set forth.

79,602.—WAGON AND CARRIAGE WHEEL.—Theodore Salorgne, St. Louis, Mo., assignor to Jacob Woodburn.

I claim the felly, perforated traversely at one or both sides of each spoke mortise, and the screw protecting wires inserted in these perforations, when constructed as herein described and for the purpose set forth.

79,603.—CALLIPER.—Sylvanus Sawyer, Fitchburg, Mass.

I claim constructing the joints which connect the legs with the stock, so as to yield in the direction toward and from each other, in combination with the geared sectors, the worm or rack, and the clamping rod, spring, or other suitable means for clamping the parts together, substantially as described.

79,604.—RIDING ATTACHMENT TO HARROWS.—Austin D. Shaver, Belleville, N. Y.

I claim a riding attachment for harrows, made with adjustable seat, H, and pole, B, curved downward at the forward end l, and secured to harrow by swivel link, a, and to frame by bolt and thumb screw, d, and ropes, E, friction rollers, i i i, with counter rollers beneath, as combined, arranged, and attached, for the use and purpose as specified and herein set forth.

79,605.—GEARING.—Alden Sibley, Pawtucket, R. I.

I claim the pinion, B, and its gear, A, as made with tapering teeth, as described, in combination with the pinion and its cylinder shaft, and means by which the pinion may be moved and adjusted lengthwise of the said shaft, and with respect to the fellow gear, A, as and for the purpose of preventing "backlash," as specified.

Also, the arrangement and combination of the endless screw, f, and the worm gear, e, with the pinion, B, and its shaft.

Also the combination of the sleeve, D, with the pinion, B, and the adjusting screw or screws, m n, and nuts, k l, thereof, for moving said pinion longitudinally of the sleeve, as set forth.

Also, the combination and arrangement of the pinion, B, the shaft, C, the sleeve, D, the adjustable screws, m n, and nuts, k l, and the worm, f and its gear, e, the whole being substantially as described.

79,606.—RAILROAD TRACK CLEARER.—Robert A. Smith, Philadelphia Pa.

I claim, 1st, The combination of an adjustable main plow, composed of parts, P and P', and the mechanism for operating the same so that the snow, dirt, or ice can be thrown to the right or to the left, by one operation, or thrown entirely to the right or to the left, as occasion may require.

2d, The king bolt, K B, and cone, C, arranged substantially in the manner and for the purpose specified.

3d, Arranging on the foot and back of the parts, P and P', constructed and operating as described, a series of brooms, M M, with a forward inclination of the beard, for the purpose specified.

4th, In combination with the brooms, M M, arranged as set forth, the application of the springs, S, for the purpose of keeping the broom beard constantly in position.

5th, The arrangement of the standard Z, and the guides, G D, substantially in the manner and for the purpose set forth.

6th, The mode of fastening the broom beard to the stay board, S B of the broom cylinder, by means of a continuous hollow strap, S I, as described.

7th, The side guards, S G and S G' with their rods, r, r1, r2, and r3, for the purpose described and represented.

8th, The within railroad track cleaner, composed of the above described parts, all combined, constructed, and operating in the manner and for the purpose specified.

79,607.—OVEN IN BASE BURNING STOVE.—Ambrose Spitzmiller, Buffalo, N. Y., assignor to John S Perry, trustee and executor, and Nathan B. Perry.

I claim, 1st, In a base burning stove, having an oven arranged over the coal magazine, providing for exposing a portion of the bottom of such oven to the action of ascending currents of heat, substantially as described.

2d, An oven, S, in combination with ascending flue, f, and a coal magazine having its upper end contracted, substantially as described.

3d, An oven, S, in combination with the flue, f, when used as a drum or dead chamber, and a coal magazine having its upper end contracted, substantially as described.

4th, Providing the elevated oven, S, of a base burning stove with openings through its side wall, one of which openings has applied to it a damper, h', substantially as described.

79,608.—MACHINE FOR SAWING STONE.—Sidney Stanton, Syracuse, N. Y.

I claim the frame, A, hollow standard, B b k, gears, E e, C c, shaft, F fg, water box, L, and chute, n, all constructed, arranged, and operating in the manner shown, and for the purpose described.

79,609.—TRACK CLEARER FOR HARVESTER.—Nathan Stonecipher, Cambridge City, Ind.

I claim the combination of the revolving cone, D, and socket, C, when used as a track clearer, in combination with a grain or grass cutter, the whole being constructed, arranged, and operated substantially as above described.

79,610.—MACHINE FOR POLISHING SPHERICAL SHOT AND SHELL.—John Blake Tarr, Fair Haven, Mass.

I claim, 1st, The within described machine, which is adapted for polishing spherical shot and shells, substantially in the manner described.

2d, The cupped polishing and centering devices, G G', constructed, arranged and operating substantially as described.

97,611.—CAST IRON CAR WHEEL.—John Blake Tarr, Fair Haven, Mass.

I claim, as a new article of manufacture, a car wheel, made of cast iron, condensed by pressure while in a molten state within a mold, substantially as and for the purpose described.

79,612.—APPARATUS FOR HARDENING STONE.—E. P. Taylor, St. Louis, Mo.

I claim the force pump, D, with a weighted piston, d', in combination with cylinder, A, air pump, B, and tank, C, the whole being operated in the manner described.

79,613.—MILK COOLER.—J. C. Thayer, Dunton, Ill.

I claim, 1st, The combination of the tanks, A B C, the latter tank being removable, and having a pipe, F, for the stem of the valve, G, to operate in, substantially as and for the purpose set forth.

2d, The combination of the valve, G, pipes, F and P, lever, H, and float, K L, substantially as herein set forth and shown.

3d, The combination of the tanks, A B C, pipes, F P, valves, G, lever, H, and float, K L, constructed and arranged to operate as and for the purpose set forth.

79,614.—WOOD-SAW HORSE.—William Tripp, Epsom, N. H.

I claim the adjustable clamp arm, i, as applied to the bar, h, by means of the notches, l, fitting on the pin, m, and as secured by the wedge, n, substantially in the manner described.

Also, the combination of the treadle, g, rock shaft, k, bar, h, and arm, i constructed to operate as and for the purpose set forth.

79,615.—BAKE OVEN.—Joseph Vale, Beloit, Wis.

I claim the rotating disk or hearth, H, secured to and turning upon the shaft, H, and the mode herein described of rotating the same, whereby expensive gear and pinions are dispensed with.

Also, the crown plate or disk, E, in combination with the fire grates, C C, covers, d d, flues, b b, regulating damper, g, flue or chimney, a a, and ash boxes, D D, when the whole are constructed and arranged substantially as herein set forth and described, to operate as specified.

79,616.—REFINING AND PURIFYING SPIRITUOUS LIQUOR.—W. P. Valentine, Buffalo N. Y.

I claim, 1st, The process of ripening, mellowing, and purifying spirituous liquors, by the use of hot and cold air alternately, substantially as herein described.

2d, The apparatus, consisting of the tubs, A and B, the chamber, D, with pipe, I, blower, C and pipe, F, with its connecting or branching pipe, G, for heating air, and pipes, c and e, with concave disks, d and f, for delivering air, whether hot or cold, near the bottom of the tubs, A and B, the whole constructed and arranged to operate substantially as herein described, and for the purpose set forth.

79,617.—PRINTING PRESS.—Lemuel T. Wells, St. Louis, Mo

I claim the springs, D, when arranged upon a rocking bar, d, and combined with a platen, A', as herein described, and for the purpose set forth.

79,618.—POINTED BRACKET FOR LIGHTNING ROD.—Martin Wells, New York city.

I claim the new article of manufacture of brackets, by combining the discharging point with the bracket which secures the rod to the building, so that the discharging point is continuous with the bracket, substantially as described.

79,619.—COOKING STOVE.—Milton Woolley, Brooklyn, N. Y.

I claim, 1st, The flue casing, B C, provided with a direct draft damper, i, and enclosing oven chambers, which are separated by a horizontal plate, E, having a furnace, D, and valve openings applied to it, substantially as described.

2d, Oven chambers, which are enclosed by a flue casing, B C, and doors, C1 C2, and provided with a furnace, D, valves, e e, and means for conducting off the vapors and gases rising in said oven chambers, substantially as described.

3d, The outer jacket, A, in combination with a furnace, D, and a division plate, E, arranged with a double wall flue casing, B C, substantially as described.

4th, The water heater, d, applied within a furnace, D, which is sustained by a division plate, E, within a double wall flue casing, B C, substantially as described.

79,620.—HOPPER SHOE FOR GRIST MILL.—Wiliam E. Wyche, and Young P. Dickson, Brookville, N. C.

We claim the shoe, D, formed of two sieves, m and n, in combination with the apron, E, substantially as shown and described, and for the purpose specified.

79,621.—BRUSH AND COMB COMBINED.—Albert A. Young (assignor to himself and Francis McLaughlin), Boston, Mass.

I claim a hair brush, having a space in its stalk and handle, or either of them, for a comb, the comb being detachable from the stalk and handle when in use, and said space opening at the extremity of the handle or the end of the stalk, substantially as described.

Also, the combination and arrangement of the brush, A, and the comb, B, whereby the comb is protected in the stalk of the brush when not in use, substantially as described.

79,622.—CABINET BEDSTEAD.—W. H. Young and L. Young, Boston, Mass.

We claim, 1st, The turn down legs, a a, serving the purpose of moldings and fastenings to the closed cabinet, and legs to the bedstead, together with the method of fastening the same, substantially as described, and for the purpose set forth.

2d, The foot board, B, as combined and arranged with the case, A, and the bed frame, substantially as described.

3d, The combination and arrangement of the spring bed frame and the several parts thereof, viz, the parts, f g and j, together with the method of fastening the slats to the cross sup ports, substantially as described.

4th, The combination and arrangement of the imitation drawer, c, with the springs, e' e' e' e', etc., and their supports, whereby, when the drawer is turned down, the parts of the spring frame, g j, are elevated, together with the method of elevating the same, substantially as described.

79,623.—DRYER.—E. H. Ashcroft, Boston, Mass.

I claim in combination with a machine for drying various materials or substances, a tank of water, when the discharge of water from such tank is effected by the action of fire accidentally taking place in such machine, for the purpose substantially as before described.

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Also, operating the valve and opening the discharging orifice of the water tank, or of regulating the flow of water to the structure, by means of a fusible plug connected therewith by any suitable means which accomplish the desired result.

Also, the combination and arrangement with the structure, D, and water tank, H, of the discharging orifice, I, valve, b, rods, c and e, and fusible plug, f, the whole being combined, arranged and operating as before described.

Also, a rod pipe, or its equivalent, combined with the discharging orifice, I, and valve, b, in such manner that upon expansion of such rod, or its equivalent, by reason of fire within the structure, the valve shall recede from and open the orifice to the discharge of water to the structure, essentially as hereinbefore described.

Also, the general combination and arrangement of the blower, A, air chamber, C, with the structure, D, and its perforated foraminous floors, E and G, and steam coil or pipe, F, the water tank, H, and the apparatus for discharging water therefrom the whole being arranged and operating substantially as hereinbefore described.

79,624.—PORTABLE FENCE.—John Augspurger, Trenton, Ohio.

I claim the clamping cleats, e f, screw bolt and nut, g, in combination with the adjustable panels, I or II, constructed and used in the manner and for the purpose substantially as described.

79,625.—WEATHER STRIP.—Benj. F. Averill, Dunkirk, N. Y.

I claim, 1st, The weather strip constructed as described, of the strip, C, fluted along its upper edge to work under and in contact with the reversely fluted plate, D, secured to the door, the plate, C being hung upon the headed pins, a, affixed to the levers, E E', beneath the plate, which levers are pivoted to the door at b b', and held up at their inner ends by the springs, f f, all arranged as described, for the purpose specified.

2d, The arrangement of the screw, d, projection, n, upon the lever, E, the pivoted pin, b', upon the lever, E', the arm, g, and incline, h, all operating as described, to depress the fluted plate, C, against the tension of the springs, f, as herein described, for the purpose specified.

79,626.—BUCKLE.—Isaac Banister, Newark, N. J.

I claim the tubular bar, B, in connection with the oscillating loop, C, when used in the manner and for the purposes set forth.

79,627.—MACHINE FOR CUTTING AND DRESSING STONE—Lafayette Barnum (assignor to himself, Levi Barnum, and Charles H. Ensign), Bridgeport, Conn.

I claim, 1st, The combination of the adjustable frames with the cams, hammers, cutters, and feeding apparatus, when the whole is constructed, arranged, and fitted to operate substantially as herein described and set forth.

2d, The apparatus for feeding the stone longitudinally, with the method of swinging it on its center, so as to form a curvilinear edge, and the edge cutters, when constructed, arranged, and fitted to operate substantially as herein described and set forth.

3d, The combination of the double edged cutters (fig. 3) with the rotary hammers, when they are constructed and used substantially as and for the purpose herein described and set forth.

79,628.—BRIDLE—Adam Bauerschmitt, Rochester, N. Y.

I claim the india-rubber strap, C, short round, e, short strap, f, and pulley ring, d, when constructed and operated in connection with a bridle, as herein described and set forth.

79,629.—MACHINE FOR MAKING CORES.—Benj. S. Benson, Baltimore, Md.

I claim, 1st, Rotating the core or core spindle, E, by means of two shafts, D D', between which it is held in the manner described, and by which it is applied to a blade, K, substantially as and for the purpose specified.

2d, The sockets, d d, by which the core is held while applied to the scraper, when connected by a rod, I, and levers, H H1, so constructed and operating that the sockets are caused to approach or recede from each other simultaneously, for the purpose specified.

3d, Operating the shafts, D D', by means of arms, F F', slides, G G, rod, I, levers, H H1, and spring, J, in connection pawls, n m, substantially as and for the purpose specified.

79,630.—ROCK CRUSHER AND TEMPERING MACHINE.—James Bingham and Robert Coward, Pittsburg, Pa.

We claim the two pairs of rollers, J and J2 and K L the spout, M, the sludge pan, X, the spider, Y, having knives, Z, the annular cylinder, A A, and their operative mechanisms, when constructed, combined, and arranged as described, and to operate in the manner substantially as set for.

79,631.—STEEL SHANK FOR BOOTS AND SHOES.—Henry Briner and Emil Briner, Manhattanville, N. Y.

We claim an improved article of manufacture, the steel shank for boots and shoes, when its free end is provided with an elastic case, C, for the purpose of preventing injury to the sole of the boot or shoe by the longitudinal motion produced by the action of the spring, as herein shown and described.

79,632.—CARPENTERS' GAGE.—O. Brown and T. F. Berry, Capron, Ill.

We claim the combination of the slides, D C, head, A, and stem, B, substantially as and for the purpose herein set forth.

79,633.—BRICK MACHINE.—Rufus Campbell and Albion P. Campbell, Hillsdale, Mich.

We claim the wheels, M, chain, N, lever, J, and beam, H, constructed and arranged to operate in combination with the weight, F, in the manner as and for the purpose set forth.

79,634.—LOOSE PULLEY.—E. S. Capen (assignor to himself and P. Blaisdell), Worcester, Mass.

I claim in a pulley having the hub combined with a lubricating chamber, as described, providing the said chamber with an opening, b, extending the length of the hub, and shaped in the manner herein specified, so that the oil discharged from the chamber upon the journal shall be forced from the ends toward the center of the hub, as set forth.

79,635.—GLASS PRESSING MACHINE.—Geo. J. Capewell, West Cheshire, Conn.

I claim, 1st, The lever, j, in combination with the arms, h and l, the spring, n, and slide, t, the whole producing the automatic movement of the pin, i, as and for the purposes specified.

2d, Forming glass beads or ornaments with the desired openings or holes, made by pressing the glass around the pin and nipple, the nipple serving as a support for the pins forming said holes substantially as described.

79,636.—HOP POLE.—Lumau B. Clark, Bainbridge, N. Y.

I claim the hop pole consisting of the wedge, A, lateral staples, B, and poles, C, all constructed as described, whereby it can driven into the ground, and reset when loosened by the frost or from other causes without disturbing the vines, as herein shown and described.

79,637.—PRESS.—James E. Connor, Brooklyn, N. Y.

I claim the arrangement of the bed, a, upon the plate, b, of the machine, and the mandrel, b, in the upper and lower heads, with the levers for operating the mandrel, as herein set forth.

79,638.—SNAP HOOK.—Wm. Cooper, Jr., and Wm. D. Rumsey, Howell, Mich.

We claim the snap hook, A, when provided with the opening, B, and pin, D, having a shoulder, F, a spring, E, a thimble, G, a d a head, I, all constructed and arranged to operate substantially as described.

79,639.—GANG PLOW.—G. A. Davison, San Leandro, Cal.

I claim, 1st, Regulating the level of the machine by the device, O O', and setscrew, P, or their equivalents, substantially as set forth.

2d, The rigid arms, H H' and G, attached to the axle and connecting the lever or sweep, J, either directly to the arm, G, or by the link, I, substantially as and for the purpose specified.

79,640.—MACHINE FOR BORING WOOD.—George Dryden, Worcester, Mass.

I claim, 1st, The connecting of the driving and carrying mechanism to a sliding plate or frame moving on the base by means of a rack and pinion for the purpose of boring the holes of mortises successively, as above set forth.

2d, The central elevating gear, when permanently in mesh with a stationary rack attached to a standard, and operated by a sliding clutch, substantially as set forth and described.

79,641.—CATHARTIC LOZENGE.—Wm. M. Bu Bois, Poughkeepsie, N. Y.

I claim the medical compound composed of the ingredients in the manner and proportions herein described.

79,642.—PIPE TONGS.—James M. Evarts, New Haven, Conn.

I claim the jaw, A, provided with the elongated slot, B, having tapered and serrated walls, in combination with the nut, D, provided with corresponding inclined and serrated faces, the jaw, C, nut, F, and the axial pin, E, substantially as and for the purpose described.

79,643.—CAR COUPLING.—James M. Everhart, Pittston, Pa.

I claim the right and left screw-threaded coupling, F, in combination with the spring rods, D, as herein described, for the purpose specified.

79,644.—HORSE HAY FORK.—E. J. Fenn, Medina, Ohio.

I claim the arrangement of the right-angled lever, D, adapted to press at its angle point upon the projection, b', formed upon the central rack bar, B, to spread the tines, D, and, upon being raised by the cord, F, permitting the bay to discharge itself from the tines, H, by gravity, as herein shown and described.

79,645.—ROOFING COMPOUND.—Lorenzo D. Ferguson, Dansville, N. Y.

I claim the combination of the ingredients herein specified, when used in the manner and for the purpose set forth.

79,646.—CAR PLATFORM BRIDGE.—B. G. Fitzhugh, Ellicott City, Md.

I claim a safety bridge for the platforms of railroad cars, which is made of a plank or board, or of a single piece of metal, and which is supported on and elevated by its ends slightly above the platforms, and united thereto at one or both ends by a flexible or yielding connection, that will prevent it from slipping off endwise, substantially as and for the purpose described.

79,647.—CORSET.—Lavinia H. Foy, Newton Center, Mass.

I claim as a new article of manufacture a corset in which the hip gores or pieces, E, are combined with the front, back, and side pieces of the corset, cut in the form and united in the manner described, and illustrated in the drawings, so as to fit the person without the insertion of further gores.

79,648.—HOP VINE SUPPORT.—P. J. Fuller, Clarksville N. Y.

I claim, 1st, A hop vine protector consisting of the post, A, and of the arms B, which are pivoted thereto so that they can be swung up or down at will, substantially as herein shown and described.

2d, The swinging arms, B, when pivoted to a post, A, and when fastened in their upright position by means of hooks, b c, or their equivalents, substantially as herein shown and described.

79,649.—LOCK NUT—Samuel Garber, Beaver, Pa.

I claim the lock block, E, placed between two adjacent nuts, D, outside the fish plates, and held in position by means of the perforated or recessed fish plates; B, or metal strip, G, and the reversed bolt and nut, F, all arranged and operating as described, for the purpose specified.

79,650.—BASE BURNING STOVE.—S. W. Gibbs, Albany, N. Y.

I claim, 1st, In combination with a stove, the reservoir or feeder, D, constructed and arranged substantially as described, for the purposes set forth.

2d, The circular tube, G in combination with the feeder, D, arranged substantially as and for the purposes described.

79,651.—MACHINE FOR CUTTING STAVES.—John Greenwood, Rochester, N. Y.

I claim the alternate arrangement of the face of ribs, a a, of the double set of rollers, g h, operating relatively with the swing bed, B, and cutter, C, substantially as and for the purpose described.

79,652.—COOKING STOVE.—Joseph H. Greer, Rochester, Pa.

I claim the reverberating flues, A A, chamber, B, reverberating flues, C C C' C'' C'', damper, D, register, R, in combination with orifices or perforations, Z, grate, L, rack, J, door knob, M, sliding door knob, P, lift hole, N, all constructed as herein set forth, or in any other manner essentially the same, and for the purposes as specified.

79,653.—SELF-DETACHING PULLEY.—J. E. Gustin, Elmira, N. Y.

I claim the pulley, B, so arranged in a frame or block by joints and hinges that it is made self detaching, substantially as and for the purpose herein shown and described.

79,654.—VELOCIPEDE.—George Hanlon, William Hanlon, Alfred Hanlon, Edward Hanlon, and Frederick Hanlon, New York city.

We claim, 1st, The seat, E, when secured upon the end of a spring, I, and when adjustable on the perch, C, substantially as described, for the purpose set forth.

2d, The extension crank, C, on the front axle, A, of the velocipede, when arranged as described, for the purpose of making the velocipede adjustable, as set forth.

3d, Providing the perch or connecting frame, C, with a forked rear end, for the purpose of allowing the use of the wheel, G, within, or of two wheels, H H, without the fork, as specified.

4th, A velocipede consisting of the bifurcated perch, C, carrying the axles, A B, of the front wheel, D, and rear wheel, G, or wheels, H, of the adjustable spring seat, E, and of the extension cranks, c, on the front axle, all made and operating substantially as herein shown and described.

79,655.—HORSE HAY FORK.—William Hannah, Middlefield, Center, N. Y.

I claim, 1st, The tripping plate, H, substantially as shown and described, in combination with the rigid cross bar, A', of the tines, a, and the hook, b, affixed to the cross bar, D, of the tubes, C C', all as and for the purpose set forth.

2d, The discharge orifice, l, substantially as shown and described, in combination with the tubes, C, of a two-tined hay fork, for the purpose of permitting the escape of the dust or harvseed, all as set forth.

79,656.—ROCKING CHAIR.—Edson Hartwell, Hubbardston, Mass.

I claim, 1st, The combination of the arms or standards, E, having curved projections, b b, with the slotted plates, F, substantially as and for the purposes set forth.

2d, The combination with the lower ends of the standards, E, of the plates, F and G, substantially as and for the purposes set forth.

3d, The combination with the seat supports or standards, E, and chair frame, of the curved pieces, D, substantially as and for the purposes set forth.

4th, The combination of the seat, A, with the springs, g g, standards, E, and chair frame, substantially as and for the purposes set forth.

79,657.—PROPELLER.—Robert Hunter, New York city.

I claim the propelling apparatus herein described, consisting of a hollow tapering bucket, C, vibrated by a lever, B, upon the stern or run of the vessel, substantially as specified.

79,658.—SCISSORS AND SHEARS.—Samuel W. Huntington, Augusta, Me.

I claim the formation of auxiliary shear blades, f, upon the inner and opposite edges of that portion of the arms or blades of scissors and shears between the pivot and handle, or in rear or the pivot, as shown and set forth.

79,659.—PAPER MAKING MACHINE.—Isaac Jennings, Fairfield, Conn.

I claim, 1st, Diminishing the size of the roller after the paper has been formed in any convenient manner, so as to admit of the papers being removed without cutting, substantially as and for the purpose herein set forth and described.

2d, The system of rollers, B, constructed and arranged substantially as herein shown and described, when used in connection with the other parts of a paper machine, in place of the ordinary single roller, as and for the purpose set forth.

79,660.—MOLD FOR MAKING STRAWBERRY RIPENERS.—Clark Jillson, Worcester, Mass.

I claim, 1st, The combination with the base, A, stem, C, and series of cams, D, of the concaved and perforated part, B, and series of cams, E, substantially as and for the purpose set forth.

2d, The combination with the parts lettered A B C D and E, of the convex and recessed piston, F, said parts being constructed and arranged for operation substantially as and for the purposes set forth.

79,661.—LUMBER DRYER.—Richard P. Johnson and Eli J. Sumner Wabash, Ind.

We claim, 1st, The double furnace, A and B, separated by a horizontal partition, and provided with a common escape flue, in the manner and for the purposes set forth.

2d, The providing the cars with curtains, or like device, in the manner and for the purposes as set forth.

79,662.—WASHING MACHINE.—John Lamb, Jeffersonville, N. Y.

I claim the cylinder, B, when provided with strips of India-rubber, in the manner set forth, in combination with the fluted vibratory rod, I, arranged and operated as and for the purpose set forth.

79,663.—MOLDING MACHINE.—H A. Lee, Worcester, Mass.

I claim, 1st, The combination with the lower feed rolls, B, the upper feed rolls, b', the adjustable pieces, D, and their concentric slotted arms, C, and the central shaft, C', of gears, 2, 3, 4, 5, 10, 11, and 12, and links, 8, 9, constructed and arranged for joint operation as and for the purposes set forth.

2d, The combination with the stands, F, and the sliding bearings, E, held to said stands by bolts, n, of the elevating and depressing shafts, G with their shoulders, 23, the parts being constructed and arranged with relation to each other as and for the purposes set forth.

3d, The combination with the presser bar, H, arms, I, and screw rods, p, of the peculiarly constructed holding and swivel bolts, o, the parts being constructed and arranged with relation with each other as and for the purposes set forth.

4th, The combination with the upper end of each or either of the shafts, K, and the slotted bar, N', of the peculiarly constructed bearing piece, N, in the manner and for the purposes set forth.

79,664.—CAR COUPLING.—Louis J. Lecocq, Orgentenil, France,

I claim, 1st, The parts, B and C, and the locking bolt, D, the spring, H, and angle, g', on the bearing part, G, all constructed, combined, and operated substantially as described, as and for the purpose specified.

2d, The compound eyes, I J, connected to and opened and closed by the motion of the locking bolt, D, of the coupling, so as to confine the safety chains, K, so long as the coupling is connected, and to liberate the safety chains simultaneously with the attachment of the coupling, substantially as and for the purposes herein specified.

79,665.—WRENCH.—John Madden, Cleveland, Ohio.

I claim the pallet, E, supplementary jaw, B, as arranged in combination with a wrench, in the manner and for the purpose sub-tantially as set forth.

79,666.—MARKING CAN—F. W. Marvin, Sacramento, Cal.

I claim, 1st, In combination with a marking can, the reservoir, C, substantially as and for the purpose set forth.

2d, The valve, D, and tubular handle, G, in combination with a marking can or pot, arranged sub-tantially as and for the purposes described.

79,667.—AIR CARBURETOR.—Wm. M. Marshall, Philadelphia, Pa.

I claim, 1st, The coiled copper or metallic pipe, E, substantially as described and for the purpose set forth.

2d, The coiled pipe, E, in combination with pipe, F, and flame, S, and with the blower, A, and carburetor, B C, when connecting the blower with the carburetor, substantially as and for the purpose set forth.

3d, The feeder, R O, with its chamber, O, funnel, R, stop cocks, N and T, and its pipe, substantially as and for the purpose set forth.

79,668.—FEATHER RENOVATOR.—C. E. Mason and G. F. Bell, Wellington, Ohio.

We claim, 1st, A cylinder constructed of wire gauze or netting, substantially as and for the purpose set forth.

2d, The cylinder, B, in combination with the box, A, in the manner as and for the purpose described.

3d, The pipes, D E, as arranged in relation to the cylinder, B, and box, A, substantially as and for the purpose set forth.

79,669.—STEAM GAGE.—Henry Matthes, Cambridgeport, Mass

I claim, 1st, The arrangement of the cap, B, the disk, A, and washer, a, substantially as and for the purpose specified.

2d, A flexible disk for steam gages, when constructed of the materials and in the proportions substantially as described.

79,670.—PARTITIONED STEAMER.—S. T. McDougall, Brooklyn, N. Y.

I claim as an article of manufacture a boiler divided into several compartments by vertical partitions, and provided with a depression in the bottom of each compartment, in combination with a steam cooking vessel on one or each compartment, constructed and arranged in the manner and for the purpose herein described.

79,671.—CLOTHES POUNDER.—S. T McDougall, Brooklyn, N. Y.

I claim, 1st, The pushers, M, connected to the arms, K, and operated substantially as described, for the purposes set forth.

2d, The combination with the same, the pounder, E, when the same shall be constructed and operated substantially as described, for the purposes set forth.

70,672.—LOW WATER INDICATOR AND STEAM PRESSURE ALARM.—David McFarland, New York city.

I claim, 1st, The float, D, constructed of a hollow cylinder, filled with hemp or other suitable fibrous material, substantially as and for the purpose set forth.

2d, The float, D, in combination with the weighted lever, G, valve, I, and pipe, e, substantially as herein shown and described.

79,673.—LOW WATER DETECTOR AND STEAM PRESSURE ALARM.—David McFarland (assignor to John Johnson), New York city.

I claim, 1st, The tilting box, G, fitted with a compartment, B, which communicates with the steam boiler below the water level by pipes, E F, and is connected with the valve, J, of a steam whistle or alarm, K, all arranged to operate in the manner substantially as and for the purpose described.

2d, The safety valve, M, connected with the valve, J, of the steam whistle or alarm by means of the lever, O, and the stem, d, of valve, J, arranged within a steam compartment, C, as shown, to admit of a movement of said valve independent of the rod, I, and box, G, and the simultaneous opening of the safety valve, M, and whistle or alarm valve, J, when the steam within the boiler exceeds a certain desired pressure.

79,674.—WOODEN PAVEMENT.—Duncan McKenzie, N. Y. city.

I claim the wooden pavement constructed as described, of the blocks, A, secured together by means of the beveled strips attached to the opposite sides of said blocks, A, in the manner substantially as herein shown and described.

79,675.—CORN SHELLER.—Joseph H. McPheeters and Philip P. Cross, Palmyra, Mo,

We claim, 1st, Making the shelling bars flattened, with rounded edges, or flat oval in a cross section, substantially as described.

2d, Making the shelling-bars with corresponding opposite edges, and arranging them in such a manner that the edge of any bar presented toward the cylinder, or the place of the bar in the bar-frame, may be readily changed substantially as described and for the purpose set forth.

3d, Making the bar-frame adjustible in its position relatively to the cylinder, D, substantially in the mode and for the purposes described.

4th, In combination with the cylinder, D, and adjustable bar-frame, J J, the endless apron, n, or cob-carrier, H.

5th, The guides, I T, substantially as and for the purposes described.

79,676.—METHOD OF CUTTING BOOTS.—Andrew J. Moore, Samuel Bleistein, and Samuel S. Shirk, Lebanon, Pa.

We claim, 1st, The pattern composed of the several parts herein shown, said parts being constructed, and arranged, and operating as herein described, for producing the upper and leg of a boot in the form shown in fig. 2 of the drawings, or in an equivalent form, as set forth.

2d, The piece, G, in combination with the pieces, D F, of the pattern, substantially as described.

3d, A boot upper and leg, T T' V V1 V2, made in one piece produced as described,

79,677.—BENDING FIFTH WHEEL.—William Morgey, Wilmington, Del.

I claim the combination of the turn-table, d, levelling-plate, b, circle plate, e, the leaves m, F, g, h, and O, rollers, i, and j, and slotted side, k, constructed and arranged as hereinbefore described, as a circle or elliptic bending machine, for bending fifth-wheels and clip-circles of carriages, and sizing and lining clips.

79,678.—MEAT CUTTER.—Henry Obrecht, Mahanoy City, Pa. assignor to Samuel Reinhart and John C, Knapp, same place.

I claim the bar, D, when swiveled to the up and down reciprocating bar or plate, C, and when passing through and connected with the revolving wheel or disk, G, all made and operating substantially as herein shown and described.

79,679.—GLOBE-VALVE—Ralph G. Packard, Brooklyn, N. Y.

I claim 1st, The within described mode of connecting the valve proper with the valve-stem, C, that is to say, by the employment of the pin, c, and cavity, e, arranged relatively to each other, and to the other parts, substantially as and for the purpose herein specified,

2d, The elastic packing piece, G, arranged, as represented relatively to the stem, C, and top-casing, D2, to prevent the escape of steam or other fluid around the stem, C, being packed or fitted with increased tightness in proportion as the pressure of the fluid is increased, substantially as and for the purpose herein specified.

79,680.—SPONGE AND DOUGH-RAISER.—Wesley Pearce, McLean County, Ill.

I claim the introduction of steam in coils of pipe, between a sponge-trough and outer box, for the purpose of raising the sponge and dough before baking, substantially as described.

79,681.—MANUFACTURE OF IRON FROM TITANIFEROUS IRON ORE.—John Player, New York city.

I claim the smelting of titaniferous iron ores with blast furnace, slag or scoria, or basalt rock, as a flux, or other equivalent, in the manner and substantially as herein described.

79,682.—CIRCULAR SAW MILL.—Frank J. Plummer, Worcester, Mass., assignor to R. Ball & Co,

I claim 1st, The combination with the shafts, B B, or either of the cams, 8 8, or either, and friction rings, 6 6, constructed to operate substantially as and for the purposes set forth.

2d, The combination with the shafts, B B, of the cams, 8 8, friction rings, 6 6, and balls, d d, substantially as and for the purposes set forth.

3d, The combination with the adjustable feed rolls, the lower end of whose shafts are received in balls, d d, mounted in the machine as described, of the sliding gears for driving said rolls, and the balls, m, and stem, n, for connecting the gears with the shafts of the rolls, under the arrangement and for the operation as herein shown and set forth.

4th, In comoination with the parts claimed in the preceding clause, the dogs, c, collars, p, wings, 4, and pins, 5, mounted upon the hubs of the gear-wheels and feed-roll shafts, in the manner and for the purposes shown and specified.

5th, The combination with the cams, 8 8, of the handle or arm, J and fastening-screws, 11, for the purpose of allowing one to operate independently of the other, substantially as and for the purposes set forth.

76,683.—MACHINE FOR TURNING CYLINDERS.—J. Morton Poole, Wilmington, Del, assignor to himself, William T. Porter and Thomas S. Poole, same place.

I claim the arrangement of one or more pairs of cutting or grinding tools or one or more pairs composed respectively of a cutting or grinding tool and a rest, upon a frame which is free to move laterally or transversely to the object which is being turned or ground, the tools constituting a pair being capable of adjustment and friction thereon in relation to one another and dependent for their movements to and from the surface of the object placed between them to be turned or ground by their contact with the surface or surfaces of said object at opposite points thereof, substantially as herein described.

79,684.—TOOL-HOLDER.—William Pratt, Providence, R. I.

I claim a tool-holder, carrying an independent cutter for engine lathes and planing machines, in which the bar or stock, A, is slotted transversely to the vertical line of the cutter, dividing the mortised end of the bar, A into an upper and lower limb, and the fastening of the cutter by drawing these limbs together with a screw-bolt and nut, or by spreading them apart by means of a set-screw passing through one limb and abutting against the other, all made and operating substantially as described, or their mechanical equivalents.

79,685.—AGRICULTURAL BOILER.—Daniel R. Prindle, East Bethany, N. Y.

I claim the combination of the caldron, A, and cover, B, so constructed as to enable the cover to be kept immersed in water, substantially as and for the purpose herein specified.

Also, the revolving elbow, H, in combination with the stationary steam-pipe, G, and flexible shifting-pipe, I, for the purpose set forth.

Also, the mode of attaching the flexible pipe to the elbow, H, substantially as herein specified.

Also, the metallic band, d, on the edge of the wooden cover, in combination with the fastening clamps, for the purpose set forth.

79,686.—ANIMAL TRAP.—Samuel S. Rain, Lowville, Ante-dated June 27, 1868.

I claim the use of the within described combination of devices for the object and purpose here set forth.

79,687.—BOBBIN.—W. H. Ramsdell, Lowell, Mass., assignor to himself and H. J. Sawyer, same place.

I claim a bobbin, constructed as described in combination with the spring, rings E, and felt or suitable absorbent packing, as and for the purpose described.

79,688.—HOG-TROUGH.—Caroline M. Rolfe, Laconia, N, H., administratrix of the estate of Charles F. Rolfe, deceased.

I claim, 1st, The detachable frame, B, provided with the trough, C, and cover, D, constructed and arranged substantially in the manner and for the purpose set forth.

2d, The securing of the frame in the side of the sty or pen, by means of the cleats, b, d and keys, E, substantially as shown and described.

79,689.—CUP FOR EFFERVESCING DRINKS.—Antonio Rottanzi, M. D., San Francisco, Cal.

I claim, in combination with the partition, B, the stops, or gates, a b c, or equivalent device, and the lid or cover, E, substantially as and for the purpose described.

79,690.—CUTTER-HEAD.—George Rowe, and S. W. Nelson, Worcester, Mass.

We claim the combination of the cutter-holding or clamping-piece, B, having flanges, C and D, with the head part, A, and its projections, b c, and bolt, 1, substantially as and for the purposes set forth.

79,691.—CARRIAGE AND RIDING WHIP.—Reuben V. Salada, and George A. Pearson, Philadelphia, Pa.

We claim the construction and combination of a carriage whip when made and arranged in the manner and for the purpose specified, as a new article of manufacture.

79,692.—COAL SCUTTLE.—Thomas Scantlin and James M. Scantlin, Evansville, Ind.

We claim a claim a coal scuttle having the body, A, formed with a fluting, c, and the edge or border just below this fluting lapped over, a conical flange, of the bottom, B, the said bottom being formed with legs, a a a a b, and ribs, e e e e, all substantially as described and for the purpose set forth.

79,693.—MILK-CAN.—David W. Shaw, Baltimore, Md.

I claim the combination of the anchor, C having, stem, e, and radial, arms, a, the followwer, e, lever-screw nut, f and packing, g h, when the upper portion of the stem, B is provided with an opening, o, to receive a lock, whereby cover, J, may be secured, as herein shown and described, for the purpose specified.

79,694.—PADLOCK.—Alba F. Smith and John H. Vickers. Norwich, Conn., assignors to Norwich Lock Company, same place.

We claim, 1st, The incline, a3, arranged as herein specified, and adapted to throw the key forward out of the holes, c, so soon as the unlocking movement is completed substantially as and for the purposes herein specified.

2d, The within described inclined projection a 4, on the back face of the front plate, A2, arranged as represented relatively to the key, E e, and catches, d, for the purpose herein specified.

79,695.—APPLICATION OF STEAM TO A PROPELLER.—William Spalding, Port Clinton, Ohio. Antedated June 18, 1868.

I claim the arrangement of the water reservoir, B, perforated rotating-shaft, E, water supply pipe, D, steam-pipe, c, valve-rod, H, reversing lever, I, valve, G, having spiral grooves, d, and propeller, F, as herein set forth for the purpose specified.

2d, The valve, G, when constructed as described with spiral grooves, d d, as herein shown and described for the purpose specified.

79,696.—BASE BURNING STOVE—James Spear, Philadelphia, Pa.

I claim, 1st, The revolving grate, S, in combination with the dumping-apparatus, consisting of the pivot-bar, T, arms, W W, lever, r, rod, t, so constructed that it can be dumped without opening the stove.

2d, The reservoir, N, constructed with a lower cast iron ring, n1, sheet-iron section, n2, upper cast-iron rings, n3 n6, so connected as to form a reservoir for the purpose shown and described,

3d, The register, H, for the purpose of admitting air between the outer section, G, and the reservoir, N, in combination with the revolving windows, d2, arranged and operating substantially ass hown and described.

4th, The combination and arrangement of the dumping-grate, S, with the fire pot, B, revolving windows, d2, reservoir, N, register, H, and swinging-urn, M, substantially as described.

79,697.—ELEVATOR.—Herman Spiro, Knoxville, Tenn.

I claim, 1st, the drums, A A, belt, g g g, f f f, boxes, I and J, and hooks a b, all substantially as shown and described, in combination with the uprights, B all as and for the purpose set forth

2d, The links, d, having rollers, l l, and eyes, substantially as described, in combination with the drum, A, and its belt of boxes, all as and for the purpose set forth.

3d, The ropes K, pulleys, L, links, N, and windlass, S, substantially as described, in combination with the uprights, B, drums, A A, and belt of boxes, all as set forth.

4th, The shoulders, P, substantially as described, in combination with the

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uprights, B, links, d, drums, A and belt of boxes, all as and for the purpose set forth.

79,698.—PANEL FENCE.—Charles W. Sproull, Rome, Ga.

I claim the combination of the projecting ends, b', of fence-panel, the regulating uprights, a, and feer, h, all substantially as shown and described, and for the purpose shown and described

79,699.—GRAIN DRYER —William Standing, Cairo, Ill.

I claim, 1st. A grain dryer composed of series of cylinders for the passage of the grain, each surrounding a central perforated air-tube, and all enclosed by a metallic case, forming a close steam-chamber, substantially as herein described for the purpose specified

2d. The grain-dryer, constructed as described, of the annular chamber, B, enclosed between the heads, a b, and each containing a central perforated tube, c, supported by radial arms, d, and extended in imperforate pipes, i, above the head, d, for conducting the moisture to the chamber, G E, the cylinders, B, being surrounded by the case, A, to form the steam chamber, all constructed and arranged as described, and supported upon the perforated conical base, N, as herein set forth for the purpose specified.

3d, The arrangement of the valves, h, supported upon the ring, K, and adjusted by means of the bifurcated plate, l, pivoted lever, L, screw-rod, S, and burr, K, as herein described for the purpose specified.

4th. The arrangement of the close steam chamber, the grain-cylinders, B, and the perforated air-tubes, C, having extended imperforate ends, i, whereby the grain is heated by steam around the cylinders, B, and the moisture discharged through the center of sail cylinders by the tubes, C, as herein described, for the purpose set forth.

79,700.—PRUNING-HOOK.—John Stark, Thomasville, Ga.

I claim, 1st. A harvesting or pruning-hook formed of two or more cutting edges, when the same are united and arranged substantially as described for the purpose set forth.

2d. attaching the hook, D, and blade A, together, as described, whereby they are rendered detachable for sharpening, as herein shown and described.

79,701.—TREATING ORES, METALS, AND MINERALS.—Chase A. Stevens, New York city.

I claim the within-described process or treating auriferous and argentiferous and other ores, clays, earths, and metallic iron, by the application of the residuum obtained from cryolite, substantially in the manner and for the purpose set forth

79,702 —CHURN.—G. R. Stevens, Chicago, Ill.

I claim the cone, E, in combination with the rod, D, and winged dasher, B C, the latter having holes, d d, made diagonally through it, substantially as and for the purpose herein set forth.

79,703.—CORN-HUSKER.—George E. Stewart, East Saginaw, Mich.

I claim the protecting device consisting of the pivoted metallic plates, A B, secured to the index-finger and thumb of the wearer by means of the curved strips, D G I and strips, E F, all constructed and operating as herein described for the purpose specified.

79,704 —REFRIGERATOR.—Anthony B. Sweetland, Fitchburg, Mass., assignor to himself and James Daley, same place.

I claim, 1st, The ice shelf, B, carrying by the central pivot, d, the pendent metallic disk, C, and supported by the curved strips, f, from the lugs, e, upon the interior of the upper removable part, A, all arranged above the inclined flange, G, which forms the channel, h, and supports the vertical tube, i, as herein described for the purpose specified.

2d. The construction of the ice shelf, B, supporting strips, f, pendent disk C, and inclined flange, G, forming the channel, h, and supporting the pipe, i, all arranged as described in the upper case, A', and adapted to be removed with said part from the lower case, A, bearing the revolving frame, J, as herein described for the purpose specified.

3d. The combination of the ice shelf, B, pendent disk, C, supporting strips, f, inclined flange, G, pipe, i, with the cases, A A', and revolving frame, J, all constructed, arranged and operating as herein described for the purpose specified.

79,705.—SPRING BED BOTTOM.—Salmon E. Tyler (assignor to himself, and William S. Stephens), Beloit, Wis.

I claim the clamps B and corrugated eccentrics, b, as and for the purpose herein set forth and described.

79,706.—COTTON-PLOW.—Theophilus A. Wainwright, (assignor to himself and Albert Farmer), Wilson, N. C.

I claim the construction of the frame, A B C, it being cast from one pattern complete, and the manner of securing thereto all of the necessary parts, as above described, by a single bolt or key each, substantially as and for the purpose set forth.

79,707.—WATER ELEVATOR.—W. P. Walling, Swartz Creek, Mich.

I claim, 1st, The projection Cx, in combination with the ring C', rope, P, pulley, b, and car, C, as herein described, for the purpose specified.

2d, The bucket, K, provided with the discharge-spout a2 in its bottom, and containing the angular valve-lever, e', the valve e of which is held closed by the spiral spring, and opened to disharge the water by means of the projection N upon post, A, fitting beneath the arm a' of said lever, as herein shown and described.

3d, The angular pivoted valve lever, in combination with the coiled spring, bucket, K, car, C, and projection, N, as herein described for the purpose specified.

4th, The grooved vibrating link, I, in combination with the slotted car, C, carved bar, H, curved arms, b', and bucket, K, as herein described for the purpose specified.

79,708.—LOW WATER INDICATOR.—Charles S. Watson, Philadelphia, Pa.

I claim 1st, The combination of the oscillating vessel, C, constructed substantially as described, with the receiver, A, lever, D, and valve, E, substantially in the manner above set forth, and for the purpose specified.

2d, The construction of the part 2 of the oscillating vessel C with the valve, F, to provide for the escape of air from the same, so that water may ascend into and fill it, as above described.

3d, The combination and arrangement of the valve G with the part 1 of the vessel C and the bar, I, substantially as and for the purposes set forth.

79,709.—SURFACE-FILE HANDLE.—Joseph Weare, Fitchburg, Mass.

I claim, 1st, A surface file-handle, composed of the bent or curved handle, A F I, in combination with a clamping device for grasping the file-shank in the manner described, so that the bent part I of the handle shall rest or bear upon the file in front of the point at which the handle is attached to the file, as and for the purposes set forth.

2d, The combination of the base, F, of the curved handle, and the clamp and its adjusting or tightening screw and nut held in said base, and covered by the horn or projection, C, the said parts being constructed and arranged to operate as herein shown and specified.

79,710.—HYDRAULIC CRANE.—Samuel K. Wellman, Nashua, N. H.

I claim, 1st, The combination, with the revolving post, e, of the projection b and the cylinder, c, substantially as shown and described.

2d, The combination, with the crane post and its husk case or shell, of the piston, H, and cylinder, c, substantially as and for the purposes set forth.

3d, The combination, with the tube, B, attached to the lower end of the crane post, of the nuts, 1 4, knee, a, and leather packing, 5, said parts being arranged in relation to each other, substantially as described, and as shown in fig. 4, of the accompanying drawings, and for the purposes set forth.

4th, The combination with the part, 11, of the carriage, n, and windlass, S, of the cushion, O', as shown and described.

79,711.—HORSE HAY FORK.—E. I. White, Locke, N. Y.

I claim the construction of the shank, A, consisting of the cross bar, a1, whose reduced ends are fitted rigidly in the tines, D, and turn freely in the tines, E, and whose arc, a2, is provided with a slotted extension, a3, carrying the hoisting and tripping pulleys, B C, all arranged as described for the purpose specified.

79,712 —MANUFACTURE OF FLOOR CLOTH.—John H. William, Essex, Conn., assignor to himself, Thomas N. Dickenson, and William E. Beames.

I claim, 1st, The spring plates, C C, or their equivalents, for distributing the paint evenly over the surface of the cloth, and also remove the extra amount of the same, substantially in the manner and for the purpose specified.

2d, The spring plates, D D, or their equivalents, as a smoothing device for the purpose of finishing the cloth, substantially as herein described.

3d, The peculiar curve of the plates herein described, when in operation, constructed of springs, or their equivaleuts to give the smooth and polished surface to the cloth as it passes through the machine, in the manner described and for the purpose specified.

79,713.—APPARATUS FOR PRINTING UPON GLASS.—Dexter B. Wingate, Natick, assignor to Needham C. Millett, Salem Mass.

I claim forming a type block of an elastic yielding material, and its use in combination with the adjustable ways, H, adjustable gage, E, and lever, L operating in connection with the movable support, C, for the purpose substantially as described and set forth.

79,714.—MACHINE FOR THREADING BOLTS.—Aurin Wood, Worcester, Mass.

I claim, 1st, The arrangement, with the spindle, B, head, B', and case, F, of the cam ring, G, arms, G i, locking pieces, I, and dies, H, the parts being constructed and operating in connection with each other, substantially as and for the purposes set forth.

2d, The notched stop or flanged collars, d e, in combination with cam ring, D, and arms, i and G, the said parts being constructed and arranged in the manner set forth, to open and close threading dies, substantially as described.

3d, The combination of the rod, o, with the weighted lever, t, arm, 5, cam 29, and lever, P, provided with arms, x and 30, said parts being arranged for operation to stop and release the notched or flanged collars, d e, substantially as and for the purposes described.

4th, The cam, 23, on the wheel, 24 and the rod, 22, working in the sleeve, P'', in combination with the spring stop, said parts being arranged to throw back the blank carriage after the threading dies are opened, substantially as described

5th, The rod, o, weighted lever, t, arms, 5, cam, 29, and lever, P, with its arms, x and 30, in combination with the connection, P', sleeve, P'', and notches or flanged collars, d e, substantially in the manner and for the purpose set forth.

6th, The combination of the spring, 27, lever, R R', wheel, N, with rack, pinion, and the bank carriage, said parts being constructed and arranged substantially as and for the purposes set forth.

79,715.—GRAIN SEPARATOR.—Daniel S. Yeakel, (assignor to Henry Deer and Solomon Deer, Dillingersville, Pa.

I claim the swinging screen, J, hung or suspended as shown, in combination with the springs, Dx Ex, all arranged and applied in the manner substantially as and for the purpose set forth.

79,716.—STOVE GRATE.—John H. Yocum, Ashland, Pa.

I claim, 1st, The provisions, in a flat or horizontal grate, or in a grate bottom of one or more apertures, c, as and for the purpose set forth.

2d, The combination with the aforesaid aperture or apertures, c, of one or more shields, f, as and for the purpose specified.

3d, Constructing a grate having one or more apertures, c, with bars converging toward said aperture or apertures, for the purpose described.

4th, In combination with a grate having one or more slag apertures, c, the dust flue, D, arranged and employed substantially as and for the purpose specified.

79,717.—DEVICE FOR HANGING MILLSTONES.—Peter Zimmerman Delaware Water Gap, Pa.

I claim the improved adjustable millstone hanging device, substantially as herein shown and described, and for the purpose set forth.

79,718.—HEATING STOVE.—F. S. Zumstein, Evansville, Ind.

I claim an improved stove or heater, formed by the combination of the outer case, A, having a close fitting cover, B, upon its upper end, and an ingress drught opening in its bottom, air pipes E, interior furnace, F, having a close fitting cover, H with an engress draught opening in it upon its upper end and ingress draught openings at its lower end, the egress draught pipes, M L and N, or their equivalent, and the water receiver, O, with each other, said parts being constructed and operating substantially as herein described, and for the purpoie set forth.

79,719.—INDIA RUBBER BASE BALL.—Henry A. Alden, Mattawan, N. Y., assignor to the New York Rubber Company, New York city.

I claim, 1st, A base-ball or other like ball having a centre or core consisting of one piece, or of several pieces of cork, cemented together, said core being surrounded with the compound substantially such as is described in Letters Patent of the United States, No. 72,355, and the whole being united and vulcanized as set forth, the said ball being either provided or not with a cover of suitable material.

2d, In a base ball formed of a vulcaulzed compound such as herein specified, the use of a wire bound or twine or cord wrapped cork core, substantially as and for the purpose set forth.

3d, The combination with a cork and rubber compound base-ball, of a rubber covering or coating, united and vulcanized with the body of the ball, substantially as herein set forth.

79,720. —GRAIN RAKE.—William Baldwin, Plymouth, assignor to himself, Joel Blakslee, Plymouth and E. Blakeslee, New Haven, Conn.

I claim the combination of several teeth, C, and prongs, G, arranged so as to gather the grain, with the supports, E, extending above said teeth, the whole constructed and arranged so as to operate substantially as specified.

79,721. —LATHE FOR SCREW CUTTING.—T. D. Bassett, Charlestown, Mass.

I claim, 1st, The combination of the jointed shaft, h, burr cutter, e, and its swinging frame, f.

2d, The combination of the elements last above mentioned with the weighted and sliding tool rest.

3d, Arranging the dead centre in the edge of the tail stock in the manner and for the puppose described.

79,722.—INKING APPARATUS FOR PRINTING PRESSES.— Thomas L. Baylis, Richmond, Ind, assignor to The American Patent Chromatic Printing Press Company.

I claim in combination with the oscillating slotted arms, F, rollers, B C D, springs, e, and fripping collars, I I', the rollers, B' D', upright bars, N, projections, u, and spring, e', arranged in relation to one another, so as to operate substantially in the manner and for the purpose set forth.

79,723.—OIL CAN TUBE.—Edgar B. Beach, West Meriden, Conn.

I claim the herein described tube, as an article of manufacture, consisting of the tube, A, spout, B, valve, C, with the head, E, the said valve arranged in the tube, A, in such relative position to the spout, B, as to open and close the spout, and all constructed and arranged in the manner set forth.

79,724 —PIPE TONGS.—James R. Brown, (assignor to E. H. Ashcroft, Boston, Mass.

I claim the arrangement and combination of the hook jaw lever, A, and the tooth jaw lever, B, when constructed as shown and described, and the latter is controlled by its shoulders, d, the pin, f, and the screw, C.

79,725.—HARNESS RING.—George H. Buckius, (assignor to C Aultman, A. C. Tonner and P. H. Sowers) Canton, Ohio.

I claim a ring, A, having one or more arms, B arranged on its periphery, substantially as and for the purpose specified.

79,726.—HANDLE FOR TEA AND COFFEE POT.—Henry Bullard, Middletown Conn.

I claim handles for tea and coffee pots, formed from hard rubber or semilar material, and so as to be attached to the tips, B and C, substantially in the manner herein set forth, as a new article of manufacture.

79,727.—LADDER.—William L. Burlingame, Leslie, Mich.

I claim, 1st, The ladders, B C, so arranged in relation to each other as to be able to be formed into one continuous ladder by means of the rounds, 2 and hooks, 3, in the manner and for the purpose herein set forth.

2d, In combination with the above, the removable platform, A when provided with hooked projection, E, slots, 4, and locking button, D, all arranged and operating substantially as set forth.

79,728.—WATER CLOSET.—William S. Carr, New York city.

I claim 1st, The hopper or container, a contracted at its upper end and adapted to receive the flange of the basin, in combination with the movable ring, that forms a sufficiently wide bearing for the said basin flange and allows for the introduction or removal of the swinging pan of the closet, substantially as set forth.

2d, The ring, f, and hopper, a in combination with the swinging pan, d, and lug, 7 upon said hopper, a, and below the ring, t, as specified, so that the concussion of the pan d, in closing will be taken on said lug, 7, and the ring, f, relieved, as and for the purpose specified.

79,729. —TOOL FOR TURNING SHAFTING, ETC.—Judson A. Cleveland, La Fayette, Ind.

I claim, 1st, The combination of the rest, D, stock, B, and jaw, C, the cutters, G, and the set-screws, l, and lugs, l', by which the cutters may be independently regulated in relation to one another, while the rest is adjustable, so as to move all the cutters simultaneously substantially as described.

2d, The stock, B, when constructed as described, in combination with the rest, D, adjusting screw, E, and a series of cutters, G G, substantially as and for the purpose set forth.

79,730.—STEAM FIRE ENGINE.—Edward R. Cole and Henry S. Cole Pawtucket, R. I.

We claim, 1st, The pump cylinder, A, constructed substantially as described, forming the chambers, A A1, and A A2, by the interposition of plunger, B.

2d, The elevated induction pipe, D D, and eduction pipe, C, connected substantially as described, for the purposes specified.

3d, The arrangement of the siphon formed induction pipe, D D2, in relation to the air chamber, C C, water way, D D, and operative parts A B, and A A2, and B B, substantially as shown and described.

79,731.—WATER WHEEL. J. M. Cook, Lake Village, N. H.

I claim the water wheel, B, having independent buckets, L L, secured to the upper plate by inclined flanches, p p, and formed with inwardly curved discharge edges, l l, downwardly curved discharge edges, m m, and curved connecting edges, substantially as and for the purpose herein specified.

79,732.—WATER AND FIRE PROOF ROOFING COMPOUND.—Franklin A. Curtis, East Saginaw, Mich.

I claim the roofing compound, when composed of coal tar, wheat or rye flour, water lime, and sand, mixed in a cold state, as herein described.

79,733.—SIDING BOOTS AND SHOES.—Henry T. Daggett, South Braintree, Mass.

I claim the combination of the gage, f, with the mechanism for changing its position, substantially as and for the purpose set forth.

79,734. —BEE HIVE.—Owen Davis, Newton, Ohio.

I claim, 1st, The combination of the boxes, A and D, boxes, I I, and comb frames, K, when the several parts are constructed and used as herein specified.

2d, A comb frame whose sides are provided with vertical grooves within which are inserted small frames, L, that are provided with comb guides, e, and braces, c c substantially as shown and described.

79,735.—SWAGING MACHINE.—F. S. De Witt, Rochester, N. Y.

I claim the beveling sections, D and E', of the swinging rollers, C, of tinners' tools, in connection with a gage, H, arranged and operating substantially in the manner and for the purposes herein shown and described.

79,736.—PROCESS OF TREATING GLUE.—Andrew Dietz, New York city.

I claim, 1st, Treating glue with rosin or other proper resinous substance and petroleum or hydrocarbon or fixed oils, substantially as and for the purposes set forth.

2d, Combining with glue, so treated and prepared, carbolic or wood acid, substantially as and for the purposes set forth.

79,737.—GLASSWARE MOLD.—Hiram Dillaway, Sandwich, Mass,

I claim a sectional glassware mold body, when constructed with a hollow hinge pin, so that water can flow from one section to another through said pin, substantially as described.

Also, in combination with the bottom and side sections of a mold body, the hooks, i, arranged to operate substantially as described.

79,738.—COOLING GLASSWARE MOLDS.—Hiram Dillaway, Sandwich, Mass.

I claim the combination, with a glassware mold body, of a water reservoir, in such a manner that the reservoir forms a part of the mold body, and moves therewith, without making and breaking the connection between the reservoir and the mold body at each impression obtained from the mold, substantially as described.

Also, the combination, with a glass moldbody, of a close reservoir, made with the coiled air tube, substantially as described.

Also, a mold body, made with drilled passages, e d o, connected by the trough-like passage, c, substantially as described.

79,739.—CHURN.—George H. Dow, Freeport, Ill.

I claim the beaters, D, as arranged, in combination with the shaft, B, saucer, J, and case, in the manner as and for the purpose set forth.

79,740.—HARVESTER.—Joseph J. Duchesne, Lacon, Ill.

I claim, 1st, The screw, a', in combination with the ferrule, a, and the slotted bar, b, as and for the purpose set forth.

2d, The chain, c, in combination with the bar, b, and tongue, A, as and for the purpose described.

79,741.—ESCAPEMENT FOR DIAL TELEGRAPH INSTRUMENT.—Benjamin Franklin Edmunds, Boston and James Hamblet, Jr., Charlestown, Mass

We claim, 1st, An escapement, consisting of an escape wheel having two rows or series of teeth, as described, and an arbor, which carries also an index impelled by a double set of pallets, one set being rigid and the other set resilient, or their equivalents, substantially as described.

2d, The double pallet anchor, or its equivalent, with its suspension arbor, its attached pallets and armature or lever, as described.

3d, The combination of the anchor pallets and pawl pallets, with the double escape wheel, as described.

4th, The combination of an escapement, constructed as herein described, with a magneto-electric machine, or an electro-magnetic apparatus, or other motor, having the effect of causing a vibratory motion of the armature or lever, M, substantially as herein set forth.

79,742.—SYRINGE.—M. Faloon, M. D., Bloomington, Ill.

I claim the piece, B, made convex on its inner end, forming a shoulder, x, and provided with a flange on the outer part, which covers the neck of the bulb, A, when arranged and used substantially as specified.

79,743.—GRATE BAR.—Addison C. Fletcher, New York city.

I claim, 1st, The reduction of the fuel-bearing portions, a, of a grate bar by the formation of air ducts, f, therethrough having communication with the main ducts, b, for the more thorough cooling and equalizing of the expansion of such portions, and increasing the air heating surfaces, substantially as shown and described.

2d, The combination of the passages, f, the channels or ways, e, and air ducts, b, with the fuel points or rests, a, all arranged substantially as shown and described.

79,744.—APPARATUS FOR DISSOLVING QUARTZ AND FOR EXTRACTING METALS.—A. L. Fleury, New York city.

I claim, 1st, The above-described apparatus for dissolving quartz or silicates consisting of the furnace, A, liquefier, K, electric apparatus, Z. tanks, f f, and absorber, V, arranged and operating as described.

2d, The furnace, A, with its fireplace, B, furnace, P, and trap, D, when used for the purposes specified.

3d, The liquefier, K as above specified.

4th, The combination of the electric machine, Z, and the liquefier, K, in the manner and for the purpose set forth.

79,745 —SINGLE HARNESS.—Orlando V. Flora (assignor to himself, J. E. Witner, and J. S. Boyle), Madison, Ind. Antedated June 27, 1868.

I claim, 1st, So arranging the circular opening in the draught plate, E, with a notch, extending forward at an angle of about forty-five degrees, that the draft bolt, C, may be passed through by rotating the plate vertically, and, when passed through, will form a fastening, for the purpose and in the manner as set forth.

2d, Placing the draught plate, E, at or near the point where the hold back strap is usually fastened, so as to allow an elastic bearing at that point on the shaft, while the other bearing of the shaft is arranged in the usual manner, for the purposes as described

79,746.—FASTENING FOR GLOVES.—M. B. Foote, Northampton, Mass.

I claim, 1st, The combination of the button, B, spring, C, and screw, D, arranged and operating substantially as and for the purposes herein set forth.

2d, The combination of the buttons, B B, metal chain E, and lever F, when the several parts are constructed, arranged, and used substantially as and for the purposes specified.

79,747.—ENAMELLED METAL COMB.—Caleb Foster, Wappinger's Falls, N. Y.

I claim a comb of any other sheet metal than steel, and enameled all over so as to represent or imitate a material of which it is made, but of which combs generally are made, as herein described and represented.

79,748.—CHERRY STONER.—George Geer, Galesburg, Ill.

I claim, 1st, The rotating octagon carrier or receiver, D, made and arranged, and operating substantially as and for the purposes above set forth.

2d, The stripper, L, arranged with the cross piece, M, and operating substantially as and for the purposes above set forth.

3d, The arrangement of the spring, G, receiver, D, and stone carrier, F, with the forks, E, when constructed and operating as specified.

4th, The arrangement of the cross piece, M, fork, E, and latch, H, when constructed and operating as set forth.

79,749.—NUT MACHINE.—A. B. Glover, Birmingham, Conn.

I claim, 1st, In combination with the hollow punch, f, punch, h, and die, a, the crowner, g, and the transfer finger, e, all arranged and operating in the manner described.

2d, In combination with the above, two or more rolls, m and n, with the follower, L and guide pin, l, arranged with the transfer finger, i, so as to operate in the manner described.

3d, In combination with the above, the crowner, g', arranged with the transfer finger, r, so as to operate substantially as described.

4th, In combination with the transfer fingers, e i r, the holding fingers, 1 2 3, when constructed and arranged so as to transfer and hold the blanks, substantially as herein set forth.

77,750.—CHANNEL BUOY.—W. W. Goff, Eagle Harbor, Mich.

I claim the reflectors, B, when attached and operating substantially as and for the purposes herein described and shown.

79,751.—PRINTING PRESS.—H. M. Hall and George W. Espey, Moore's Hill, Ind.

We claim, 1st, The movable paper clamp, G, when arranged as described, so as to receive the necessary movement from the raising and lowering of the platen.

2d, The combination of the clamp, G, and fingers, H, when arranged as described, for the purpose of holding the paper.

3d, The combination of the cam shaft, F, and hooks, E', for giving the impression to the paper, as set forth.

4th, The combination of the clamp, G, rod, h', and standard, L, with the slotted hinged platen, B, when arranged and operating substantially as and for the purpose described.

79,752.—LUBRICATING PULLEY.—David Harrington, Worcester, assignor to himself and S. A. Woods, Boston, Mass.

I claim, in combination with the hub of a loose pulley, an annular chamber, extending continuously around the hub, and opening all around into the bearing surface thereof, this chamber being cored out in casting, and being narrow at the bearing surface, and enlarging back therefrom, substantially as shown and described.

Also, in combination with the oil chamber, c, the lateral ducts, made shallow at their outer ends, and deepening and widening towards and into the main chamber, c, substantially as described.

Also, in combination with the main annular chamber, c, and the lateral duct or ducts, an end groove, h, connecting with the lateral duct or ducts, substantially as shown and described.

79,753.—ELEVATED RAILROAD.—Charles T. Harvey, Tarrytown, N. Y.

I claim, 1st, The construction and arrangement and adjustment of a supporting column, composed of two or more independent cylinders or tubes, substantially as described.

2d, The combination of the several cylinders or tubes of the combined column, the frame, J, in which the track rests, and the bolts or keys that connect said tubes and frame together, substantially as described.

3d, The method of connection of the cylinders or tubes of the combined column to the base plate, by means of bolts or keys, substantially as described.

4th, The construction and arrangement of the ends of the frame, J, upwards or over the flanges of the track, to serve as a guard to confine the latter in place, with or without the wooden keys, M, substantially as described.

79,754.—ELEVATED RAILROAD.—Charles T. Harvey, Tarrytown, N. Y.

I claim the combination of a supporting column of an elevated railroad with beams, E, to which it is secured, and with the pavement or cover D, in such a manner that the column is supported above or over vault, A, substantially as and for the purpose described.

79,755.—MODE OF PROPULSION AND CONSTRUCTION OF ELEVATED RAILWAYS.—Charles T. Harvey, Tarrytown, N. Y.

I claim, 1st, The construction and arrangement of a driving drum having elastic ribs across its face, in combination with a propelling cable.

2d, The construction and arrangement of a driving drum having compressing cams, in combination with a propelling cable operated by any stationary motor for railway or analogous purposes, substantially as described.

3d, The construction of a driving drum with a central elastic cushion for receiving the impact of and imparting motion to a propelling cable for railway or canal transportation purposes, substantially as described.

4th The construction of the opposing surfaces of the compressing cams, B, with a series of corrugations and depressions for obtaining greater adhesion substantially as described

5th, In combination with a driving drum for railway or analogous purposes, the construction and arrangement of intermediate adjustable frictional attachments to the stationary motor, substantially as described.

6th, The open cable guide, Q, substantially as described.

7th, The arrangement of cable guides, and combining the same with a double track of a railway and a driving drum in such manner that an endless cable running therein will propel cars in opposite directions on the different tracks, substantially as described.

8th, The construction and arrangement of anti-friction pulleys or rollers in the sides of a cable guide at points where the cable diverges from a straight line, substantially as described.

9th, The flanges, U, on the periphery of a driving drum, substantially as and for the purposes above mentioned.

79,756.—RAILROAD CAR.—C. T. Harvey, Tarrytown, N. Y.

I claim 1st, The arrangement of the coupling arm, V, of a car in such a manner that it will be automatically disengaged from the cable when the arm is moved beyond a certain point, substantially as described.

2d, The construction and arrangement of car trucks or running gear of a car in such a manner as will admit of the placing or hanging of the car body between the trucks, substantially as described.

3d, The combination of the girders, saddle bars, H, and trucks, substantially as described and shown.

4th, Hinging the coupling arm, V, in such a manner that it will swing upward, and allow the car to be moved in a reverse direction to the motion of a propelling cable, substantially as shown.

79,757.—CAR WHEEL.—C. T. Harvey, Tarrytown, N. Y.

I claim, 1st, The combination, with the wooden central body of a car wheel, of a removable metallic flange or flanges, substantially as described.

2d, In combination with the above, the removable metallic tire, i, substantially as described

3d, The combination of the central body of a car wheel, as described, and the removable metallic tire, i, with the elastic packing, k, as and for the purposes set forth.

79,758.—STOVE PIPE DAMPER.—Joseph Healey, Jr., Detroit, Mich.

I claim, as a new article of manufacture, the stovepipe damper herein described, the same consisting of the central open plate, A, the disks, F, having an annular space, G, and the columns, H, when the parts are cast in one piece substantially as specified.

79,759.—ANNEALING POT AND SAUCER.—John Hibell, Nechells, England.

I claim, 1st, The improvements in annealing pots for annealing iron and steel wire, sheet metal, and other articles herein before described, and illustrated in the accompanying drawing; that is to say, making the said annealing pots of two concentric hollow cylinders, of different diameters, the space between the said hollow cylinders constituting the annular chamber, in which the articles to be annealed are placed, the said annular chamber being exposed to the fire and heat, both on its outer and inner sides, substantially as described and illustrated.

2d, The improvement or improvements in the saucers used for supporting annealing pots in the furnaces or muffles in which they are heated, hereinbefore described, and illustrated in the accompanying drawing; that is to say, making the said saucers with a double flange, by means of which the bottom of the annealing pot is protected from the injurious action of the fire, substantially as described and represented.

79,760.—PARLOR ICE CREEPER.—Lewis G. Hoffman, Albany, N. Y.

I claim a detachable spur for an ice creeper, in combination with the plate, A, or its equivalents, substantially in the manner and for the purpose above described.

79,761.—HANGING SWORD.—D. B. Howell, New York city.

I claim the tubular slide, C, pivoted to the frog or plate, D, in combination with the suspending chain, B, substantially as shown and described, for the purpose specified.

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79,762.—QUARTZ MILL.—W. W. Hubbell, Philadelphia, Pa.

I claim the opposite apertures, g g, and revolving arms, i', operating in the lower part of the pot, e, containing the nuts, c c', d d', and plates, k j, in combination with the two sets of stones, a a, b b, and the opposite inclined conduits, p p, elevators, s s, v v, r r, hoppers, y y, all constructed and arranged one with the other, as and for the purpose set forth.

2d, The combination of the grinding plates, k j, with concave interiors and angular exteriors, ribbed or thickened backs, and the pot, e, when so secured together, by means of the saddles, l, and bolt, l', as to leave the angular spaces, x, substantially as herein described.

79,763.—FIREMAN'S EXTENSION LADDER.—Robert H. Jones, San Francisco, Cal.

I claim, 1st, The combination, in a fireman's extension ladder, of the sliding frames, A A1 A2, with the sliding telescopic tube, I I1 I2, substantially as above described.

2d, In combination with the extension tube, I I1 I2, the reservoir, I, provided with several supply pipes, M M M, substantially as and for the purposes specified.

3d, The rotating platform, N, when used in connection with a fireman's extension ladder, substantially as and for the purposes described.

4th, The sliding bridge, V, operated by the wheels, T Y, when used in combination with a revolving platform, N, substantially as and for the purpose specified.

5th, The combination of the carriage, c, with the screws, z z, by which it is adjusted to a level when standing upon inclined ground, substantially in the manner described.

79,764.—APPARATUS FOR ATOMIZING LIQUIDS.—Henry Kraut, St. Louis, Mo,

I claim the arrangement of the tubes, B and C, inside of the vessel, D, so as to be protected from all external influences.

79,765.—PREPARING COTTON SEED FOR PLANTING.—Robert M. Lafferty (assignor to himself, J. E. Prutzman, and J. P. Prutzman), Three Rivers, Mich.

I claim the method of cleaning and preparing cotton seed for planting, substantially as hereinbefore described.

79,766.—EYE PROTECTOR OR CHIP ARRESTER FOR LATHES.—Charles T. Lamphere, Greenfield, Mass.

I claim an apparatus, constructed and arranged for use, substantially as described, for protecting the eyes from chips or metal shavings and similar substances.

79,767.—SCREW CUTTING LATHE.—J. P. Theodore Lang, Washington, D. C., assignor to himself, E. H. Ashcroft, Boston, Mass., and S. S. Fahnestock, Washington, D. C.

I claim the lever, L, governor plate, H, and worm wheel, G, in combination with the feed screw, E, as and for the purpose set forth.

79,768.—DRAW BRIDGE.—C. K. Marshall, New Orleans, La.

I claim the construction and arrangement of the traveling trucks, a a, with suspended platforms, E E, when the same is supported, braced and guided, as herein described, and combined with the tubular bridges, A A, the whole supported on piers, in the manner and for the purpose herein described.

79,769.—TOBACCO COMPRESS.—John H. McGowan, Cincinnati, Ohio.

I claim the ears, D D, provided with the slots, e e, in combination with the swing bolt, E, and key, I, or swing bolt, F, and collar, H, connected, arranged, and operating substantially as described.

79,770.—PAVEMENT.—B. F. Miller, New York city.

I claim the prismatic sills, laid as specified, and receiving the block superstructure, substantially as set forth.

79,771.—CIDER MILL.—W. S. Oborn, Marion, Ohio.

I claim the press beam, D, plunger rods, b', screw posts, E, screws, E2, and swivel nuts, D', all arranged and operated substantially as herein set forth.

79,772.—WATER ELEVATOR.—Wm. M. Palmer, Middlebush, N. J.

I claim the combination of the cylinders, D and D', the shaft, G, and clutch, H, with the cylinders, E and E', and shaft, L, and clutch, K, and ropes, F and F', for alternately raising and lowering the buckets, B, through a distance that may be adjusted as required, by the continuous revolution of the shaft in one direction, substantially as set forth.

79,773.—CHURN.—Philip Penington, Union City, Ind.

I claim the combination of the dashers, E F, on the movable arms, D D, having recesses c c, and slides, e e, for securing to the journals, d d, in the churn, A, to operate as set forth.

79,774.—FASTENING THE LINING TO THE SOLES OF BOOTS AND SHOES.—D. H. Priest and H. S. Wolcott, Boston, Mass.

We claim, 1st, The automatic facing or rim, c, operated by the springs, d e and f, or their equivalents, in combination with the last, b, for the purpose of protecting the lining, substantially in the manner specified.

2d, The combination and arrangement of the lever, g, with its adjustable plate, j, and the parts, i h and B, for the purpose of operating upon the rim, c, substantially in the manner specified.

79,775.—CORN HARVESTER.—E. W. Quincy, Lacon, Ill.

I claim, 1st, The brace board, k, applied to a corn harvesting machine, substantially as and for the purpose described.

2d, The elevating and gathering apparatus, constructed as described, when applied in combination with the brace board, k, to a corn harvesting machine machine, substantially as and for the purpose described.

3d, The combination of the shucking with the gathering apparatus, the former consisting of the spout, m, with its endless apron, said apron having prongs, n', and the plate, u, with its stripping or lice, n', said orifice being made capable of accommodating itself to ears of different sizes, as and for the purpose set forth.

4th, The buckets, h, when constructed with their front sides higher than their rear sides, as and for the purpose described.

5th, The vertical rollers, I, in combination with the brace boards, as and for the purposes described.

79,776.—WHIP HOLDER.—A. C. Rand, Westfield, Mass.

I claim the combination of the base with the springs bent in the form of bows, as described and secured thereon, all constructed and operating substantially as described and for the purposes herein set.

79,777.—BOOT CRIMPER.—J. M. Reed, Boston, Mass.

I claim as my invention a boot crimper composed of the jawed clasp, the screw, and the pyrimidal block, with the retaining teeth formed upon the latter, essentially as herein shown and described.

79,778.—ADJUSTABLE SPRING.—A. Roff, Southport, Conn.

I claim the adjustable spring, A, provided with a ratchet and dog for increasing or diminishing its tension, substantially in the manner and for the purpose set forth.

79,779.—HARNESS BUCKLE.—I. Roraback, South Bend, Ind.

I claim the sides, D, provided with inclined slats, E, cross plate, F, and filling, C', as arranged, in combination with the tongue, G, and roller, H, in the manner as and for the purpose specified, as a new article of manufacture.

79,780.—UMBRELLA.—Lewis Roth, Newark, N. J. Antedated July 2d, 1868.

I claim the arrangement of the brace, B, extending from the thimble, E, to the arm, A, above the regular brace, I, in the manner and for the purpose named.

79,781.—ROTARY FLUID ELEVATOR.—S. P. Ruggles, Boston, Mass.

I claim the combination, in one case or box, of two float wheels that move, one before the other, and then both together, for the purpose of passing air, gas, or water through the case in one direction only, and prevent it from flowing back, substantially in the manner and for the purpose set forth.

79,782.—TOY HOUSE.—Emily S. Russell, Plymouth, Mass.

I claim a toy house, made of two thin sheets of material secured together, the outer sheet having swinging doors and blinds, concealing or disclosing representations of apartments on the inner sheet, and the space between the sheets being adapted to movements of a doll, n, substantially as described.

79,783.—MITERING MACHINE.—J. M. Seymour (assignor to himself and Daniel Whetlock), Newark, N. J.

I claim, 1st, The adjustable foot, b, stem, H, double clamp, G, and the arms F F, when combined with a miter machine in the manner and for the purpose specified.

2d, The adjustable foot, b, when constructed to move on the line of the edge of the knives, and close thereto, as specified and shown.

79,784.—MACHINE FOR POLISHING SLATE, ETC.—E. Snyder, Slatington, Pa.

I claim, 1st, The smoothing machine, herein described, having two or more pairs of polishing wheels, revolved in opposite directions, and mounted one above the other, so that the slates may feed through the series by gravity all substantially as and for the purposes herein set forth.

2d, In such machine, automatically increasing and diminishing the distances apart of the polishing surfaces, so that the machine is self-adjusting for each thickness of slates, substantially as and for the purposes herein set forth.

79,785.—SLEIGH BRAKE.—G. B. Stevens, Pluckemin, N. J.

I claim, 1st, The combination with the turning rod, D, of the open bearings, constructed and applied to the cross brace, B, as and for the purpose set forth.

2d, The arrangement of the open bearing, the flanged turning brake rod, and the plates, G, beneath the side pieces, as described.

79,786.—GLASS PRESSING MACHINE.—Michael Sweeney (assignor to Sweeney, Bell & Co.), Wheeling, West Va.

I claim, 1st, The combination of a machine for pressing glass and a pressure blast, the tubes leading from which are so arranged that cold air currents, generated by the blast, shall be directed against the surfaces of the pressing mechanism, substantially as and for the purpose set forth.

2d, So arranging the pipes, M and N, leading from the pressure blast, I, as to direct the currents of air to the mold, G, and against the plunger, C, substantially in the manner set forth.

79,787.—SHARPENING SAW.—Otis A. Tefft, Plattsburg, assignor to Joseph Frazier, Clinton county, N. Y.

I claim the rod or shaft, M, provided with crank, Q, and spiral spring, N, in combination with bar, P, frames, B and G, all constructed and arranged to operate as described and for the purposes specified.

79,788.—SHOE HOOK.—E. L. Tevis, Philadelphia, Pa.

I claim a shoe hook constructed and operated for the purpose and in the manner above described and set forth.

79,789.—KNITTING MACHINE.—Orison Twombly, Holderness, N. H., and Wm. Noyes, Jr., Newburyport, Mass.

We claim, 1st, The needle cylinder, D, provided with a screw thread, D', in combination with the cam, C, screw, S, and bed plate, A, constructed and operating substantially as and for the purpose specified.

2d, The needle cylinder, D, provided with a screw thread, D', in combination with the reversible cam, C, slotted thread guide, E, screw, S, and bed plate, A, substantially as and for the purpose set forth.

79,790.—MANUFACTURE OF DESICCATED COCOA NUT.—Geo. W. Waitt, Philadelphia, Pa.

I claim the improvements in the mode of desiccating and preparing the meat of the cocoa nut, substantially as described and for the purposes set forth.

79,791.—SMUT MILL.—R. Ward, Edinburg, Ind.

I claim the smut mill with drum, L, constructed as described, with chamber, M, suction pipes, N and O, and the fan in the drum, R, with their various parts all constructed, arranged, and operating substantially as and for the purposes specified.

79,792.—DEVICE FOR OPERATING SHUTTERS.—Thos. Watson, Brooklyn, N. Y.

I claim, 1st, The combination of the sliding lever, d, the turning socket, e, locking pin, f, and the vibrating lever, c, with the guide, b, on the shutter and window sill, all arranged and operating substantially as shown and described and for the purpose specified.

2d, The combination with a window shutter or blind, of the stop pin, f, with the sliding lever, d, and the turning socket, e, substantially as and for the purpose specified.

79,793.—SPUR.—Samuel Wherly, San Francisco, Cal.

I claim the graduated holes, b b b, or their equivalents, in the sides of the band, A, and the pin, c, near the end of the sprig, E, for adjusting the spur to the heel, substantially as described.

79,794.—COMPOSITION FOR FORMING MOLDED AND COATED ARTICLES.—Samuel Whitmarsh, Northampton, Mass. Antedated June 27, 1868.

I claim, 1st, The combination of blood with asbestos, for the production of a composition applicable either in a liquid or solid form, substantially as described.

2d, A composition made up of blood and mineral or earthy matter, mixed or ground together and afterwards exposed to a temperature of 350° Fah., or thereabout, to give to it a hard and waterproof character, essentially as herein set forth.

79,795.—MOP WRINGER.—H. B. Willoughby, Ottawa, Ill.

I claim the combination of the levers, J K E, braces H G, supports, F F, treadle, D, frame, A, hoop, B, with rollers, L L', the latter being arranged to open and close over the top of a wash vessel, as and for the purpose herein shown.

79,796.—FASTENING FOR NECK TIES.—Elias Woodward, Brooklyn, N. Y.

I claim the detachable fastening for a bow or scarf, formed with penetrating points, o, elastic connection, d, and hook, C, combined and arranged as described.

79,797.—HARNESS RING.—William Yates (assignor to C. Aultman, A. C. Tonner, P. H. Sowers, and G. H. Buckins), Canton, Ohio.

I claim a ring, A, having a base, B, arranged in its interior by means of one or more arms, C, substantially as and for the purpose herein specified.

79,798.—CASTER FOR TRUNKS.—W. H. Young and L. Young, Boston, Mass.

We claim the revolving shank, c, with its head, d, the shoulder, e, and the roller, f, combined and arranged with socket, b, the screw, g, and the strip, h, substantially in the manner and for the purpose above set forth.

79,799.—AIR ESCAPE FUNNEL.—J. I. Beaumont, St Paul, Minn.

I claim the combination of the inner funnel, B, having thereon the wire rods, b, with the outer funnel, A, containing the apertures, c and d, the whole being constructed and arranged in the manner and for the purposes substantially as herein described and set forth.

REISSUES.

49,203.—REFITING STOP VALVE.—Dated August 1, 1865; reissue 3,020.—Charles S. Hall and Charles F. Hall, Brooklyn, N. Y., by mesne assignments of Samuel Wing.

We claim, 1st, The concave mill, B, either provided with or not an internal yielding centre, c, and arranged in suitable bearings, a in combination with the adjustable centre, c, constructed and operating substantially as and for the purpose set forth.

2d, The guide, E, and conical mill, D, applied in combination with each other, substantially as and for the purpose described.

3d, An improved portable apparatus constructed substantially as herein described, for refitting the valves and valve seats of stop valves and water cocks.

74,582.—DEVICE TO PREVENT HOGS FROM ROOTING.—Dated February 18, 1868; reissue 3,021.—George O. Nixon and William L. Nixon, Sandyville, Ohio.

We claim the within-described device, consisting of the plate, A, arms, C C, with holes, D D, and wire, B, the several parts being arranged and used substantially in the manner and for the purpose herein specified.

49,647.—APPARATUS FOR BUILDING WALLS AND EXTRACTING STUMPS. Dated August 29, 1865; reissue 3,022.—George W. Packer, Jr., Mystic River, Conn.

I claim, 1st, The within-described combination and arrangement of the pyramidal frame, M M1 M2, and curved reaches, E1 E2, with the four wheels and their accessories, substantially as and for the purposes set forth.

2d, The employment of braces, P1 P2, in combination with the struts, M, etc., and the curved reaches, E' E'', and arranged to be supported on wheels, substantially in the manner described, so that the braces shall aid in maintaining the curvature or arching condition of the reaches by connecting each to the struts above, at one or more points, as and for the purpose herein set forth.

3d, The spherical based rocker, C, having the king bolt, D, connected thereto by a loose joint, as represented, in combination with a trussed frame, M, etc., and with the wheels, substantially as and for the purposes herein set forth.

34,945.—FEMALE SUPPORTER.—Dated April 1, 1762; reissue 3,023.—Alexander D. Reeves, Portland, Me.

I claim the sack h, made as and for the purposes herein set forth, and supported by the belt and braces, arranged as herein described.

77,248.—SAFETY TRUCK.—Dated April 28, 1868; reissue 3,024.—S. Y. Bradstreet, Monticello, Iowa.

I claim, 1st, The combination of the inclined grooved wheels, C C, with the horizontal bracing wheels, F F, substantially as and for the purpose set forth.

2d, The spring, J, in combination with the sliding plate, G, and fixed plate or block, H, substantially as and for the purpose set forth,

3d, An auxiliary truck provided with inclined wheels, C C, and bracing wheels, F F, and sliding vertically in guides, H H in the manner and for the purpose indicated.

4th, The combination of the plates, G G', with the wheels C C, F F, the spindles, D D, having shoulders, d d, and the nuts, a a, substantially as and for the purpose specified.

5th, The guide blocks, H H, when supported by pivots, M M, working in elongated bearings, in the manner and for the purposes described.

6th, The rubber cushions, e e, when used in combination with the auxiliary safety truck above described, in the manner and for the purposes specified.

44,337.—PUMP.—Dated September 20, 1864; reissue 3,025.—Eli Perry, Baldwinville, N. Y.

I claim, 1st, The combination, with the wings, E, of the eccentric arms or extensions, E', forming a division between the discharge space, B, and the interior of the case, except through passages, i, in the manner and for the purpose specified.

2d, The combination, with the wings, E, and extension E', of the flanges, k, in the manner and for the purpose specified.

3d, The under side of the wings, formed with sharp edges, l l, the same being used in combination with the floor of the case, A, substantially as described.

41,583.—MACHINE FOR SPLITTING AND STRIPPING LEATHER.—Dated February 9, 1864; reissue 3,026.—Caleb S. Stearns and Thomas Corey assignees of Caleb S. Stearns), Marlboro, Mass.

I claim, 1st, A carrying cylinder, B, provided with an automatic grasping mechanism, substantially as set forth.

2d, A carrying cylinder, B, with its grasping mechanism, in combination with a splitting knife, C, and spring presser, D, or equivalent, substantially as and for the purpose described.

3d, A carrying cylinder, B, with its grasping mechanism, splitting knife, C, and presser, D, in combination with a pair of grooved rollers, E F, a series of stripping knives, G G, and knife or guide shear, I, substantially as and for the purpose set forth.

22,681.—COOKING STOVE.—Dated January 18, 1859; reissue 1,684, dated May 31, 1864; reissue 3,027.—Philo P. Stewart, Troy, N. Y.

I claim, 1st, The supplying of a continued current of atmospheric air, heated by the front plate of the fire box or chamber of combustion, and in a flue, chamber, or space immediately in front of the same, and in combination therewith, without the aid of any intervening plate or plates, to the oven of a cooking stove in which the oven is in the rear of the fire chamber, and at the same time extending under and beyond it, so as to include the said flue, chamber, or space at the lower part thereof, and thus and thereby permit the said heated air to enter the said oven in the manner and for the purposes substantially as herein described and set forth.

2d, The flue, space, or intervening chamber, A A', immediately in front of the fire box or chamber of combustion, with a fire grate and ash pit or chamber combined therewith, and the whole arranged and suspended in the front and upper corner or part of the oven, t, into which space or intermediate chamber atmospheric air is admitted through apertures, x, or any equivalent thereof and therefor, and which are and shall be in and through the plate or door or doors in the front part of the cooking stove, and in combination with the oven of such stove, so that the air heated within such intermediate chamber, substantially as herein set forth, may or shall be conducted to and into the oven, for the purposes and by the means substantially as herein described and set forth.

3d, In a stove constructed with an oven, and with a fire box or chamber of combustion, having a fire grate therein, and an ash pit or chamber below, and all combined therewith substantially like the one herein above described and set forth, the making of the front plate of the stove to open with a door or doors, k, and the attaching an apron in the front of the stove so as to receive and contain a kitchen or other suitable roaster, substantially as specified herein, so that the heat radiated by the front plate of the fire box or combustion chamber shall be aided by the heat radiated by oven plates therein, in the manner and for the purposes substantially as herein described and set forth.

4th, The employment and arrangement of the front doors, k, constructed with apertures, x', or any equivalent thereof and therefor therein, in combination with the fire box or chamber of combustion, a, by means of which atmospheric air, in a highly heated condition, is admitted to the oven of a cooking stove, for the purposes substantially as herein described and set forth

5th, The employment and arrangement of a door or doors, k, or any equivalent thereof and therefor, so that the same, or a part thereof, shall open (in the front of the cooking stove) in front of the fire box or chamber of combustion, in combination with a fire chamber or chamber of combustion, having a fire grate therein, and ash pit or chamber combined therewith, and arranged and suspended in the front part of the oven of a cooking stove, in the manner and for the purposes substantially as herein described and set forth.

6th, The arrangement of a fire chamber or chamber of combustion, with a fire grate and an ash pit or ash chamber combined therewith, and the whole suspended in the front part and upper corner of the oven of a cooking stove, in the manner and by the means substantially as herein described and set forth.

7th, The employment and arrangement of the additional or extra bottom and encasement, v, in combination with the flues of the bottom of a cooking stove and immediately underneath the oven, i, and with the space or chamber between the same and the bottom plate of the stove, in the manner and for the purposes substantially as herein described and set forth.

8th, The employment and arrangement of the additional or extra back and encasement, u, in combination with the ascending and descending flues in the rear end of a cooking stove, and between the rear end of the oven and the rear vertical end plate of the stove, in the manner and for the purposes substantially as herein described and set forth.

9th, The employment of a corrugated plate, perforated along the front thereof, for the top of the oven, i, as arranged in connection with the flue, b, and fire chamber or chamber of combustion and with the rear and vertical plate of the oven of a cooking stove, substantially as and for the purposes herein described and set forth.

10th, The employment and arrangement of the front damper or valve, Y, in the front and hearth of a cooking-stove, in combination with the flue or flues (as the case may be) immediately underneath the oven and bottom plate of the oven of a cooking-stove, in the manner and for the purpose substantially as herein described and set forth.

11th, The employment and management of the damper, n, or any equivalent thereof, and so combined with the flues of a cooking-stove, having a boiler or reservoir supported outside and back of the rear vertical end of a cooking-stove and over a heating chamber or flue, so that the direct action of the heat upon such boiler or reservoir may be thrown or shut off, and the same caused to pass through other parts and flues of said cooking-stove before entering such chambers immediately underneath such boiler or reservoir and acting thereon for the purpose of warming or heating the water therein, in the manner substantially as herein described and set forth.

12th, The employment or arrangement of the boiler or reservoir having a removable or detachable cover or top, and containing two inclined flues or tubes, which are separate at the bottom or lower end thereof from each other and which unite at the top or upper end thereof, and thus and then form but one pipe, in the manner and for the purpose substantially as herein described and set forth.

EXTENSIONS.

CONVERTING RAILROAD CAR SEATS INTO BEDS OR LOUNGES.—Henry B. Myer, of Cleveland, Ohio.—Letters Patent 11,699, dated September 19, 1854; reissue No. 711, dated May 3, 1859; again reissued, No. 123, dated October 8, 1861.

I claim, 1st, The forming of berths in railroad cars by means of the backs of the transvers seats, substantially as described.

2d, The forming of berths in railroad cars by means of the transverse seats, in combination with the corresponding supplemetary cushioned or uncushioned frames, or their equivalents, to fill up the spaces between the transverse seats, substantially as described.

STEAM GENERATOR.—Finley Latta, of Cincinnati, Ohio, administrator of A. B. Latta, deceased.—Letters Patent No. 11,025, dated June 6, 1854.

I claim the dividing of the coil or coils, commencing with one, then dividing into two, and then subdividing into four, or any other number, as shown or described, or any equivalent device.

SOFA BEDSTEAD.—Charles F. Martine, of Boston, Mass.—Letters Patent No. 11,026, dated June 6, 1854; reissue No. 336, dated December 25, 1855; reissue No. 2,757, dated August 27, 1867.

I claim, 1st, The single spring mattress, so constructed and arranged with a sofa having a hinged back as to form, when the back is dropped from an upright to a horizontal position for forming a bed, an even surface, without joint or centre depression, substantially as and for the purpose specified.

2d, So constructing and arranging the single spring mattress, with a sofa having a hinged back, that when the back is raised from a horizontal to an upright position for forming a sofa, said mattress shall be drawn up or depressed longitudinally at or near its centre by means of cords or their equivalents, and will have the appearance and effect of two separate cushions, one for the seat and the other for the back of the sofa, substantially as specified.

3d, The arms, separated in the centre, when used in combination with the sofa and mattress, constructed in the manner and for the purpose described.

DEVICE FOR HOLDING PIECES IN SPOKE MACHINES.—Marinda Starks, Genoa, N. Y., administratrix of Isaac Starks, deceased, and of Lyman Perrigo, Groton, N. Y. Letters Patent No. 11,084, dated June 13, 1854.

I claim the manner of holding and operating the spoke in the carriage, so that upon slackening the tail screws at the one end, the spoke is forced backward and made capable of being turned without disturbing it from its centers, and is restrained from turning when set, by means of the sliding and turning socket bar in the headstock, provided with a clamp head fitting in a V or other suitably shaped recess in the headstock, and the socket bar with its clamp head forced backward by a spring or its equivalent, substantially as specified, whereby great expedition and truth is insured in turning and setting the spoke.

METHOD OF GOVERNING THE ACTION OF VALVE COCKS.—Frederick H. Bartholomew, New York city. Letters Patent No. 11,113, dated June 20, 1854; reissue No. 1,071, dated Nov. 13, 1860.

I claim, 1st, The combination of these three elements or devices, viz., first, a variable chamber, provided with proper apertures for admission and discharge of fluid. * * * * * * * * * *

2d, Two valves acting to open and close a passage through which water may flow, the one being on its seat, or closing the passage when the variable chamber is of largest capacity, and the other being in a like position, or performing the same office when the capacity of the chamber is smallest; and * * * * * * * * *

3d, A proper connection between the valves and the variable chamber, so applied that the motions of the former shall be controlled by the latter, the whole three being constructed and acting in combination, substantially in the manner and for the purposes hereinbefore described, when operated upon by any competent force.

4th, The combination of two valves, a variable chamber, and a connection between them all, substantially such as hereinbefore last enumerated, with a seat or platform, substantially such as is herein described, by means of a connection substantially such as set forth, whereby the seat or platform, the valves, and the variable chamber all act in unison, substantially as set forth.

5th, As a means of preventing concussions on pipes supplying urinals or hopper closets, where the amount of water used is not a material consideration, and where yielding seats or platforms are employed to open a supply valve, I claim the combination, substantially as hereinbefore described, of a variable chamber, a single valve, and a yielding seat or platform, with proper connections and attachments, so that the motions of the valve may be caused by the seat and governed by the variable chamber, substantially as described.

6th, I claim the combination of a diaphragm performing the duty of a stuffing box, with a valve or valves, and with a variable chamber controlling the valve or valves, the whole constructed and operating substantially as hereinbefore recited.

METHOD OF GOVERNING THE ACTION OF VALVE COCKS.—Frederick H. Bartholomew, of New York city.—Letters Patent 11,113, dated June 20, 1854; reissue 1,072, dated November 13, 1860.

I claim, 1st, A pan provided with a proper rock shaft arm, or its equivalent.

2d, A valve or cock to open or close a passage way leading from a street main, or its equivalent, to a basin of a pan closet.

3d, A variable chamber, connected with the valve, so as to control its motions in either or both directions, by retarding either its opening or closing or both.

4th, A spring, or its equivalent, compressed when the valve is opened, and expanding to close the valve when the pressure upon the spring is released.

5th, A lever so connected to the pan and to the valve, as to open both when force is applied to the lever; and,

6th, A counter balance, or its equivalent, acting to raise or shut the pan, but not operating to close the valve; intending to claim none of these parts separately, but in combination only, and when all of them are constructed and operate in combination, substantially as herein described.

METALLIC GROMMET.—Thomas Alexander, of West Hampton, Mass., executor of John Alexander, deceased.—Letters Patent, 11,108, dated June 20, 1854.

I claim, 1st, Making the portion of the tube put through the ring to correspond, or nearly correspond, with the corners of the canvas or cloth, so that when they are bent down upon the canvas, they double or bend it over the edge of the ring and confine it firmly, substantially as described for the purpose set forth.

2d, is the scores in the ring, which correspond, or nearly correspond, with the corners of the cloth and with the points of the tube, in combination with the points of the tube aforesaid, substantially as described.

3d, is scoring or otherwise roughening the surface of the rings where they come in contact with the cloth, so as to make them hold the canvas firmer and better.

4th, is making or inserting points in one or both of the rings, to extend through the canvas into the opposite ring, or otherwise.

5th, is riveting the points of the tube, which are bent over on the cloth or otherwise, substantially as described.

TENTERING CLOTH.—Warren Shaw and Parley G. Green, Wales Mass.—Letters Patent, 11,141, dated June 20, 1854.

We claim the adjustable, obliquely situated tender wheels, G G, provided with laterally playing tender points, j j, in combination with the oscillating guides i i, arranged and operating in such a manner as to seize the cloth and stretch it uniformly, at the same time bringing its edge perfectly even and straight, in which position it is delivered to the tender points of the drying apparatus, to be retained thus till dried and received by the folding apparatus, substantially as herein set forth.

HARVESTER RAKE.—Collins B. Brown, Upper Alton, Ills.—Letters Patent 11,249, dated July 11, 1854.

I claim imparting the required movements to the rake, I, by combining with its handle, I I, the horizontally-vibrating fulcrum lever, h, and the outer end of the lever, G, which has a compound vertical and horizontal movement imparted to it by means of the crank-pin, e, pivot, g, nut, i, and the curved slotted inner portion of said lever, G, substantially as herein set forth.

CAST IRON VISE.—Charles Parker, Meriden, Conn.—Letters Patent 11,137, dated June 20, 1854.

I claim casting the movable jaws or chap of a vise so as to enclose and secure by the operation one or more wrought iron bars within the tail or guide rod at or near the point of greatest strain, said bars being enlarged or bent a the ends the better to secure the same to the casting in order to act as a cord or cords to resist tensile strain, and thereby secure the maximum of strength with the minimum of metal as described.

EYELET MACHINE.—Hyman L. Lipman, Philadelphia, Pa.—Letters Patent 11,260, dated July 11, 1854.

I claim the combination of a fastener, and a reservoir of eyelets, I, the conveying apparatus for carrying the eyelet from one to the other, made and operated substantially in the manner herein described.

I also claim the threading of the eyelets upon a rod or stem from which they may be delivered one at a time to the carrying apparatus, substantially as described.

PROCESS OF MAKING STEEL DIRECT FROM THE ORE.—Geo. Hand Smith, Rochester, N. Y.—Letters Patent 11,338, dated July 18, 1854; reissue 3,333, dated August 14, 1866.

I claim the process substantially as herein described, for converting iron ores directly into steel by subjecting the ore in the comminuted state, in connection with carbon, and with or without other flux, in a close oven, retort, or equivalent vessel, to a high degree of heat, and when coverted treating it in a reheating furnace to weld and ball the particles, and then hammering, rolling, or squeezing the balls to express the impurities and complete the welding and compact the mass as set forth.

I also claim in the process of conversion, charging the comminuted ore and charcoal or other carbonaceous substance in the cementing oven, or other equivalent vessel, in alternate layers, substantially as and for the purpose specified.

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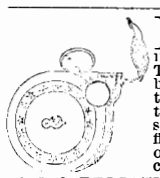

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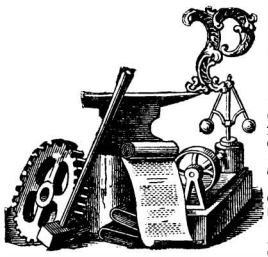

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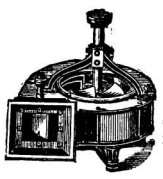

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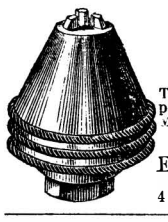

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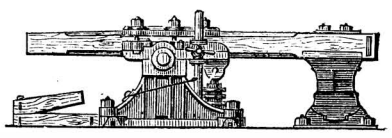

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